MIDWAY

A Magazine of Discovery in the Arts and Sciences

THE MYSTERIES OF GALAXY M87

W. A. HILTNER

On Understanding Non-Christian Religions

ERNST BENZ

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Averaged polarization observations of the "jet" in galaxy M87. The lower figure is to the same scale as the photograph above obtained by W. Baade with the Hale 200-inch telescope at Mount Palomar. The lines show the average polarization in the three condensations of the "jet." The direction of the magnetic field is perpendicular to these lines. The open circles refer to observations of areas other than the jet where no significant polarization was detected.

THE MYSTERIES OF GALAXY M87

By W. A. Hiltner

One man, gazing at the stars, postulates a theory. A second, using a delicate light-measuring instrument he has perfected, collects data which substantiate the first man's theory. Bit by bit, our earth-bound scientists piece out the mysteries of outer space. But, as each new piece of the puzzle is fitted into place, other and more baffling ones appear. Recently, in the Astrophysical Journal, *W. A. Hiltner of Yerkes Observatory, Williams Bay, Wisconsin, reported to his colleagues on some photoelectric observations he had made of polarization in the "jet" [arm] of galaxy M87. S. Chandrasekhar, editor of the* Astrophysical Journal, *and himself an internationally famed astrophysicist, called the report "one of the most exciting" to appear in recent years. Herein, scientist Hiltner explains for* MIDWAY'S *readers what he observed and its significance on the horizons of intergalactic exploration.*

What holds our Galaxy together? What is the origin of cosmic rays? What is the source of the strong radio noise from outer space? How are stars formed? These are just a few of the questions we hope may someday be answered by the study of magnetic fields in the Galaxy and in nebulas.

Large-scale magnetic fields, other than those of the earth and the sun, were unknown until a decade ago. In the short

time since then, evidence has rapidly accumulated indicating that magnetic fields in the Galaxy must provide stability of the dust and gas in its spiral arms; that these fields may accelerate atomic nuclei to high energies, producing what we call "cosmic rays"; and that many radio sources inside and out of the Galaxy must be electrons spiraling in magnetic fields.

The story of magnetic fields in the Galaxy began in 1948, when Enrico Fermi postulated the existence of such fields in the vastness of space between the stars. These fields, according to Fermi, could accelerate atomic nuclei to produce cosmic rays.

Then, in 1949, John S. Hall and I discovered quite unexpectedly that the light from some stars is polarized, that is, that the light waves are strongest in some particular transverse direction.

The first question was whether the light was polarized when it was emitted by the stars or whether it became polarized on its journey through space. All the observational evidence supports the latter theory—that the starlight becomes polarized in transit to the earth. For example, nearby stars show little or no polarization, while the light from distant stars is usually polarized. The only reasonable explanation for this phenomenon is based upon the existence of large-scale interstellar magnetic fields. These fields can align particles of dust which exist in clouds between the stars, and such aligned-particle clouds will polarize starlight passing through them. Thus the light from more distant stars should exhibit a greater degree of polarization, since it must pass through more interstellar dust. If this theory is valid, the observations suggest that the magnetic field lies in the plane of the Galaxy.

When many distant stars were observed, it was found that their polarizations are not all in exactly the same direction; the standard deviation is about 11 degrees. Assuming that this

lack of exact parallelism is caused by the random motions of interstellar gas clouds, which distort the magnetic field, one can compute the approximate strength of the field; it is about ten-millionths of a gauss. This is a very weak field by our usual standards—so weak that it cannot be detected in the laboratory. (For example, the magnetic field of the earth is about 1 gauss.) But the total energy in such a field, summed over all the space occupied by the Galaxy, is considerable—ten thousand times more energy than the entire Galaxy radiates in a year.

It can also be shown theoretically that a magnetic field of about this strength is necessary for stability of the spiral arms of the Galaxy. The combination of these independent theories, each based upon the hypothesis of a galactic field of the same strength, lends strong support to our belief in the existence of such a field.

With the establishment of large-scale magnetic fields in the Galaxy, new opportunities were opened for the explanation of other perplexing phenomena. Consider the Crab nebula—a luminous gaseous cloud, about 4 light-years in diameter, which surrounds a central star about 3,000 light-years from us. [A light-year is a convenient unit of distance in astronomical work. It is the distance covered by a beam of light, which travels at the speed of 186,000 miles per second, in a period of a year—a total distance of about 6 million million miles. By way of comparison, the earth is about 8 "light-minutes" from the sun; the diameter of our Galaxy is 100,000 light-years; the nearest large galaxy is about 1.5 million light-years away.] In all likelihood the Crab nebula was formed when the central star exploded in A.D. 1054. [The date is fixed by calculating its rate of expansion and tracing it back to find about when the gas was originally at the central star; this gives a date of about 1050, and old Chinese and Japanese chronicles record the ap-

pearance of what very probably was the same nova in exactly 1054.] For many years this nebula was a paradox. Its visual spectrum shows emission lines of hydrogen, helium, oxygen, nitrogen, and a few other elements—nothing unusual. However, in addition to these bright lines, the spectrum shows a continuum, that is, light in which all "colors" are present. It was impossible to account for this continuum radiation unless a mass for the nebula of twenty to thirty times that of the sun was assumed. But the original nova from which the nebula was formed is a so-called Type I, and this type of nova does not have an original mass more than about twice the solar mass. Furthermore, the Crab is a strong source of radiation in the radio-frequency range, which was also inexplicable.

An escape from the paradox was suggested in 1953. It was shown theoretically that both the radio and the continuum optical radiation can be accounted for if it is assumed that both a magnetic field and very fast electrons exist in the nebula. The field forces the electrons to move in spiral paths, and these spiraling electrons emit a characteristic radiation, commonly called "synchrotron radiation." The wave length (or "color") of the radiation will depend both upon the strength of the magnetic field and upon the speed of the electrons; the faster the electrons or the stronger the field, the shorter the wave length. If the field strength is of the right size and the electrons have a broad range of energies, radiation in both the optical (wave lengths about 10^{-4} cm.) and the radio (wave lengths from several centimeters to several meters) regions will be emitted. Such radiation has, among others, one very interesting characteristic: it is polarized, with the plane of vibration the same as the plane of the electron's orbit.

Hence a very simple test could be made of the theory: Is the light from the Crab nebula polarized? Observations prove that indeed it is. The theory shows that the radio and the optical

radiation can be fully accounted for if the nebula contains a magnetic field of 1 ten-thousandth of a gauss—ten times as strong as the general galactic field—and electrons with all energies up to 1,000 billion electron volts (our laboratory accelerators have so far produced particles with energies up to 28 billion electron volts). This mechanism requires a mass for the nebula of less than one-hundredth that of the sun.

But often a theory aimed at explaining a particular phenomenon has other perplexing implications. It can be shown on the basis of the theory just given that an average electron in the Crab nebula which is radiating visible light will lose half its energy in about 100 years. Thus such an electron will cease to be an optical emitter in a time which is short compared to the 900-year life of the nebula, and these high-energy electrons must be replenished in some way. We can only guess that the old nova is still actively producing electrons with the necessary energies, but we are at a loss to explain how.

Thus far we have shown that there is good evidence for magnetic fields which permeate our Galaxy and which are stronger than the average in local areas such as the Crab nebula. The next important question is: Are these fields a feature peculiar to our own Galaxy, or do they exist in galaxies generally, throughout space? Such a galactic field should have considerable influence upon the structure and evolution of the galaxy containing it, and widespread galactic fields must certainly play a part in cosmologic theories.

It has now been established that our famous neighbor galaxy, the Andromeda nebula (M31 in the astronomer's catalogue), has a magnetic field rather like that of our own Galaxy. There is another interesting case—M87, a member of a cluster of galaxies in Virgo, about 20 million light-years distant. It has long been known that this galaxy has a peculiar "jet," a series of condensations in a line projecting from the center of the

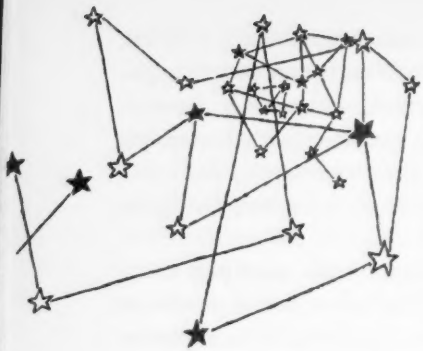
nebula. There are five condensations visible on photographs, but the innermost and outermost ones are quite faint. The three brighter central features have a diameter of about 200 light-years and are strung out over a distance of 2,000 light-years (the diameter of our own disk-shaped Galaxy is about 100,000 light-years). Again, like the much smaller and nearer Crab nebula, the jet shows strong radiation of all colors in the visual spectrum, and the galaxy is also a strong source of radio radiation. Photographs taken by W. Baade with the 200-inch telescope at Mount Palomar show that the light from the jet is polarized. This suggests that the radiation in the radio and optical spectra is, as in the Crab nebula, emitted by electrons spiraling in a magnetic field.

Recently, accurate photoelectric observations were made at the McDonald Observatory at Fort Davis, Texas (operated jointly by the universities of Chicago and Texas), of the three brighter parts of the jet. These observations were made with a photon counter, a device developed by the author which records individual light quanta collected by the telescope. [The photon counter is a bit of electronics that counts the number of photoelectrons given off when light strikes a photoelectric surface. The telescope serves only as a collector of photons for the photon counter.] The efficiency of such a device is considerably higher than can be obtained by collecting the light on a photographic plate.

The observations clearly show that the light from the condensations at the ends of the chain of three is polarized, with the plane of polarization almost along the center line of the jet. However, the center condensation has a direction of polarization at right angles to the other two! If one could hold a magnetic compass in the two end knots, the needle would stand at right angles to the center line, and, as we move into the central knot, the needle would jump 90 degrees and point

along the center line. A simple calculation shows that the magnetic field in the jet must contain an energy of 10^{56} ergs—ten times that of our own galactic field. Astronomers have no explanation for the origin of this peculiar twisted magnetic field or for the source of the energetic electrons in M87, but such an explanation should provide a strong test for future theories.

The role which interstellar magnetic fields must play in the evolution of galaxies and in the formation and evolution of stars is still wholly unknown, but it is expected to be important and perhaps predominant. Theorists are now groping for methods by which to apply this newly discovered phenomenon to the solution of some of the fundamental problems in our understanding of the universe.



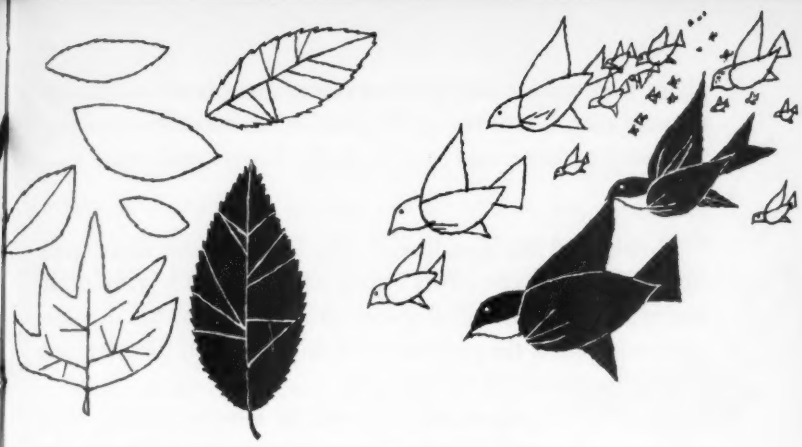
HOW TO COUNT THE

By EUGENE S. McCARTNEY

"The sand of the seas, and the drops of rain, and the days of eternity, who shall number?" This question is reverently and awesomely asked in the first chapter of Ecclesiasticus, but many other aspects of nature might have been named to suggest endless multiplicity and man's insignificance in a boundless universe.

Among the symbols of innumerability are leaves, twigs, trees, flowers, and reeds in the vegetable kingdom; birds, bees, ants, flies, locusts, and fish in the animal kingdom; stars and clouds in the heavens; raindrops, hail, and snowflakes among the elements; and waves, together with sand and shells along the seashore.

Mathematical enumerations do not always suffice to give an adequate idea of vast multitudes, nor are they always suitable for poetry or even for literary prose, so that authors inevitably



E UNCOUNTABLE

"Mathematical enumerations do not always suffice to give an adequate idea of vast multitudes . . ." so where does a poet turn? To the sand, the leaves, the birds. . . .

have recourse to vivid ways of indicating "a great multitude which no man could number" (Rev. 7:9).

A pattern for Greeks and Romans, and indirectly for later writers of other countries, was established by Homer. The setting of the *Iliad* is in Asia Minor. If Homer was born in Ionia or lived there a long while, he would have become familiar with the Oriental's habit of expressing ideas colorfully and also with his proneness to exaggerate, especially when numbers are concerned; but one does not have to postulate oriental influence to account for Homer's striking methods of indicating huge numbers.

The three aspects of nature that most frequently betoken innumerability in Greek and Latin are leaves, grains of sand, and waves. In the Bible sand and stars are most common. Not a few ancient authors compare (generally by simile or meta-

phor) large numbers or vast assemblages of persons or things to more than one of the most abundant manifestations of nature, such as leaves and sand or shells, flowers and seeds.

LEAVES

Throughout the ages leaves seem to have been used more frequently than any other aspect of nature to signify great multitudes, and so I shall give a rather large number of comparisons to show the persistence of this usage and the efforts to impart freshness and variety to it.

My oldest Greek example occurs in Homer (*Iliad*), who compares the number of the Achaeans upon the plains of the Scamander to the leaves and the flowers of springtime. In another passage Iris tells an assembly of the Trojans that she has never before seen so large a host as that of the Achaeans, for they are countless, like leaves and grains of sand. Homer provides still another illustration (*Odyssey*): The Cicones who attack Ulysses and his men are as numerous as leaves or as the flowers that bloom in the spring.

An early writer, Bacchylides, thus describes an experience of Heracles in the lower world (trans. R. C. Jebb): "There, by the waters of Cocytus, he perceived the souls of hapless mortals, countless as leaves quivering in the wind, where flocks graze on the gleaming headlands of Ida."

According to the Alexandrian poet Apollonius Rhodius, no one could compute the number of the Colchians as they gathered along the banks of a river, for they were as countless as the waves of a stormy sea or as the leaves that drop on the ground in autumn.

A passage in a far different vein occurs in the *Anacreontea* (trans. J. F. Davidson):

> If you can count the leaves of the trees,
> Or the foaming waves of the untamed seas,

Then I will entrust to you alone
To reckon the amours I have known.

In Vergil (*Aeneid*) the souls of the dead that hover on the banks of the Cocytus as they wait for Charon are as many as the leaves that fall when the first frost comes or as the birds that gather to cross the sea when wintry weather approaches.

A new turn is given to Vergil's picture by Dante (*Inferno*; trans. H. F. Cary):

As fall the light autumnal leaves
One still another following, till the bough
Strews all its honours on the earth beneath,
E'en in like manner Adam's evil brood
Cast themselves, one by one, down from the shore . . .

Milton (*Paradise Lost*) describes Satan's evil spirits as lying "entranced Thick as autumnal leaves that strow the brooks/ In Vallombrosa."

Byron effectively introduces into "The Destruction of Sennacherib" contrasting similes in which both living and fallen leaves appear:

Like the leaves of the forest when Summer is green,
That host with their banners at sunset were seen;
Like the leaves of the forest when Autumn hath blown,
That host on the morrow lay wither'd and strown.

SAND

As already noted, Iris compared the Achaean hosts before Troy to both grains of sand and leaves, but there is an equally interesting use of the word "sand" elsewhere in Homer (*Iliad*): Achilles would not comply with Agamemnon's wishes under any circumstances, not even if his gifts were as numerous as sand and dust. Since grains of sand defied enumeration, the

Theban lyric poet Pindar asks who would be able to tell the good deeds of Theron, a victor in the chariot race at Olympia.

Among the Romans, Catullus is fond of comparing things to sand. He tells Lesbia that he wants as many kisses as the number of Libyan sands or as the numerous stars that on a silent night gaze on the trysts of lovers. In another poem he says that one should count the particles of African dust and the shining stars before undertaking to enumerate the raptures of a bridal pair. A bucolic poet, Calpurnius Siculus, states that one who would wish to count the fruit he was going to harvest would more quickly number the sands.

We find, however, certain exceptions to the traditional view that it was impossible to count the grains of sand. The marvelous achievements of Archimedes led people to believe that he had numbered the sands of the entire world. The Pythian priestess had a somewhat similar reputation, for Herodotus records an oracle which says that she knew the number of the sands. According to Pindar, Phoebus Apollo knew the number of the leaves that the earth puts forth in spring and the number of the grains of sand driven before wind and wave.

In the Bible things that exist in measureless profusion are often compared to sand and dust. Two of the several biblical verses that apply to the children of Israel may be quoted here:

> And I will make thy seed as the dust of the earth; so that if a man can number the dust of the earth, then shall thy seed also be numbered [Gen. 13:16].

> . . . I will multiply thy seed as the stars of the heaven, and as the sand which is upon the sea shore [Gen. 22:17].

In the Apocrypha, too, we have standard comparisons. The great army of Nebuchadnezzar that went forth from Nineveh was likened to both sand and locusts (Jth. 2:20), and the

forces that King Ptolemy of Egypt gathered together were "as the sand which is by the seashore" (I Macc. 11:1).

The familiar Catullian pattern of comparison is quite evident in the poem from "Light Conceits of Lovers" that Thomas Campion (1567–1620) addresses to his "pretty false-ey'd wanton":

> Sooner may you count the starres,
> And number hayle downe pouring,
> Tell the osiers of the Temmes,
> Or Goodwin's Sands devouring,
> Then the thicke-shower'd kisses here
> Which now thy tyred lips must beare . . .

Ben Jonson's poem "To Celia," in "The Forrest," is also based upon Catullus:

> Kisse, and score up wealthy summes
> On my lips, thus hardly sundred,
> While you breath. First give a hundred,
> Then a thousand, then another
> Hundred, then unto the tother
> Adde a thousand, and so more;
> Till you equal with the store,
> All the grasse that *Rumney* yields,
> Or the sands in *Chelsey* fields,
> Or the drops in silver *Thames*,
> Or the starres that guild his streames . . .

WAVES

Waves, too, serve as a symbol of multitude. They appear in a rather lengthy simile in Homer (*Iliad*): "Even as when . . . many a swollen wave rolleth onward, and on high the spray is scattered beneath the blast of the wandering wind; even so many heads of the host were laid low by Hector." Also like

waves are the successive labors and "side labors" of Heracles, for, as one goes, another comes (Sophocles, *Trachiniae*). The tragic poet Phyrnichus seems to have been bewildered by the great number of figures in dances, for he said that they were as numerous as the waves of a tempestuous sea.

Counting waves came to be regarded as a type of futility or uselessness, and the name of a certain Coecylio, who attempted to number them, became a byword. In a fable that Lucian ascribes to Aesop, a fox says to a man who has lost count of the waves: "Why, my friend, will you give yourself so much uneasiness about what is past? Think no more of the waves that are gone, but begin and number those before you."

Wishing to know the varieties of vines and their names is virtually like wishing to know how many waves of the Ionian Sea strike the shore or how many grains of sand in the Libyan Desert are disturbed by Zephyr (Vergil's *Georgics*). And one who can count the waves of the sea or the sands of Libya can count the number of Eutropius' masters.

Cicero surprises the reader by reversing the usual method of making comparisons. He asks what eddies and currents in the turbulent Euripus and other straits are as numerous as the eddies and currents in the changeable Roman system of elections.

The Romans used the words "wave" and "surge" (*aestus, fluctus, unda*) to indicate numberless cares, wraths (*irae*), wars, tribes, and other things.

The picturesque expression "sea of faces" has been in our language a long while; but we now have a more vivid one from Korea, "human-sea assaults," which suggests the inexhaustible resources in manpower that enabled the Chinese to send wave after wave of attackers against the forces of the United Nations.

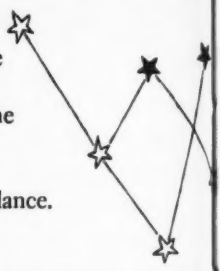
Many things are compared to the stars. Homer (*Iliad*) likens to them the number of campfires of the Trojans bivouacking on a plain. From Sophocles (*Trachiniae*) we learn that sorrow and joy succeed each other in endless round, like the circling path of the Bear. And Callimachus foretells a time "when the Titans of a later day shall rouse up against the Hellenes' barbarian sword and Celtic war, and from the furthest West shall rush on like snowflakes and in number as the stars when they flock most thickly in the sky." "You are counting stars" became a proverb to signify a vain or an endless task.

Romans, too, were fond of such comparisons. Catullus asks Lesbia for kisses as numerous as the stars, and Ovid vouchsafes that there are as many maidens in Rome as there are stars in the heavens, grain on Gargara, clusters of grapes on Methymna, fish in the sea, and birds concealed in leaves.

The banishment of Ovid from Rome brought upon him by land and sea "misfortunes as many as are the stars that lie between the hidden and the visible pole" and, in the phrasing of another passage, "woes as many as the stars that shine in heaven, or the grains that the dry dust holds."

As already noted, God promised Abraham that his seed should be as the dust of the earth, but Genesis (15:5) gives another basis of comparison: "Look now toward heaven, and tell the stars, if thou be able to number them: and he said unto him, So shall thy seed be." The number of descendants is here so immense that it seems like ridiculous exaggeration to make the number of merchants in Nineveh still greater: "Thou hast multiplied thy merchants above the stars of heaven" (Nah. 3:16).

Another example of the usage may be found in Wordsworth's captivating lines about daffodils:



Continuous as the stars that shine
And twinkle on the milky way,
They stretch'd in never-ending line
Along the margin of a bay:
Ten thousand saw I at a glance
Tossing their heads in sprightly dance.

CLOUDS

A beautifully phrased passage in Theocritus compares the myriads of kine coming home at evening to watery clouds driven by Notus or Thracian Boreas. A commentator makes this analysis of the picture:

> The endless number of clouds coming up from the horizon, borne along and huddled together by the wind, and their spreading over the sky as they advance, are well-selected points of comparison with the progress of the cattle returning from pasture, as the thin line in the distance expands and fills the plain.

Plutarch likens to a cloud the terrifying approach of the Teutones and Cimbri toward the Alps and Italy in 102 B.C. And he says that, when Alexander was marking out with meal the boundaries for the prospective city of Alexandria, birds of every sort and size settled on the land in clouds and ate the meal.

A well-known biblical usage is "cloud of witnesses" (Heb. 12:1).

THE ELEMENTS

Anyone in search of a metaphor for a heavy flight of missiles would be apt to think of rain, especially a driving rain. The translation of one of the few extant lines from the early Latin

poet Ennius reads: "From every side a rain of weapons, so to speak, converges upon the tribune." The original contains the apologetic *velut*, which seems to indicate that Ennius regarded the comparison as a rather bold one, but in another fragment he calls a dense flight of missiles an "iron rain" (*ferreus imber*), a phrase used by Vergil (*Aeneid*): "it toto turbida caelo / tempestas telorum ac ferreus ingruit imber."

A wealthy Roman, Claudius Etruscus, had amassed so much wealth from mines, farms, flocks, the sea, and other sources of riches that Statius says that it would be easier to count the winter rains (raindrops?) or forest leaves than to enumerate his possessions.

In Greece and Italy pelting hailstones have always been a menace to crops, especially to vineyards, so that it was natural for the Romans to use *grando* in a transferred sense. A fragment of Pacuvius tells of an engagement in which "it hailed and snowed with arrows, stones and rocks." Livy speaks of a *grando* of stones, and Ovid praises a soldier for his part in an assault in which stones more numerous than winter's hail were thrown. In Silius Italicus one finds "a fierce hail of stones" and also mention of towers that resounded under "a thick hail of stones." At the wedding festivities of Perseus and Andromeda the followers of Phineus, to whom the bride had been promised, break in and attack Perseus and his friends, whereupon, according to Ovid, missiles fly thicker than hail.

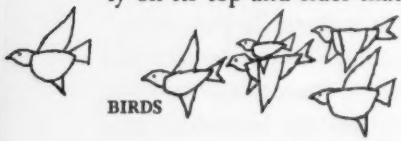
Comparisons with snowflakes appear as early as the poems of Homer. Amid a struggle between Achaeans and Trojans stones fly from both sides like snowflakes (*Iliad*), and in an elaborate simile stones are said to be as numerous as snowflakes (*ibid.*).

In Ecclesiasticus (43:17) the falling of snow suggests birds or locusts settling down upon the land.

Perhaps there is a Homeric echo in Vergil (*Aeneid*) when he says that opposing forces poured forth darts from all sides like snow. A much later epic, the tenth-century *Waltharius*, a Latin poem narrating the exploits of Walter of Aquitaine, describes a battle in which the flying arrows were as numerous as snowflakes. At the Battle of Crécy "the English archers . . . let fly their arrows so wholly [together] and so thick, that it seemed snow" (Froissart).

Many things other than missiles are likened to snow because of their abundance. When the vessel that Darwin made famous, the "Beagle," had left the Rio de la Plata and was about ten miles from the Bay of San Blas, it encountered a flight of butterflies so vast that even with the aid of a telescope it was not possible to see a space free of them. The sailors said that it was snowing butterflies.

It may not be irrelevant to note that, "when the French explorer Jacques Cartier first saw Great Bird Rock [in the St. Lawrence Gulf] in 1534, white sea birds were massed so thickly on its top and sides that he thought it was snow-covered."



BIRDS

As is true of several other kinds of comparison in my collection, the one that likens huge groups of persons to flocks of birds begins with Homer (*Iliad*). The Greek host that poured forth upon the plains of the Scamander River reminded him of the flocks of geese or cranes or swans beside the Cayster.

Vergil, too, thinks of flocks of birds when he wishes to convey an idea of the countless souls of the dead beside the Cocytus. From the walls of Tomi, Ovid saw dense masses of enemies that made him think of birds.

A few striking passages may be cited to indicate in what

great numbers birds congregate. Pliny the Elder tells us that quail, which migrate across the Mediterranean in unbelievable numbers, were a menace to seafarers, for, as they approached land, they perched on sails and sank boats. I see no reason to doubt that vast numbers of quail could capsize small sailing boats. For centuries migrating quail rested on the island of Capri in such masses that the bishop of the island supported himself by taxes levied on those who made a business of netting them. He was called "the quail bishop."

Persons who disbelieve Pliny may find it hard to credit Audubon's record of the damage passenger pigeons did to forests:

> Many trees two feet in diameter, I observed, were broken off at no great distance from the ground; and the branches of many of the largest and tallest had given way, as if the forest had been swept by a tornado. Every thing proved to me that the number of birds resorting to this part of the forest must be immense beyond computation.

On an occasion when the pigeons darkened the sun, Alexander Wilson, the ornithologist, unaware of the reason for it, expected a violent tornado to follow.

A still different way of indicating countless numbers is illustrated by a contributor to the *Saturday Evening Post* of July 14, 1951. He says of a bird refuge at Lower Klamath Falls, Oregon: "There are enough birds to strip twenty acres of ripening barley at twilight and twenty more at dawn."

LOCUSTS

Nations who have seen flights of locusts inevitably make them symbols of large numbers. In a play by Aristophanes a certain Sitalces vows to help the Athenians with an army as numerous as locusts.

The words most frequently used by Greeks and Romans to suggest the countless number of locusts in a flight are *nephos* and *nubes*. On the authority of Eudoxus, Aelian relates that the people of Galatia prayed to birds to come and save their crops whenever a cloud of locusts was menacing their land. Pliny notes that locusts form a cloud over immense areas and obscure the sun. He adds that they make such a noise with their wings that they are mistaken for birds.

Jerome believed that a prophecy made in Joel 2:10 would be fulfilled by locusts: "Denique prae multitudine locustarium obtexentium caelum, sol et luna convertentur in tenebras et stellae retrahent splendorem suum."

Another vivid description of the ravages of locusts is given in Exodus (10:15):

> For they covered the face of the whole earth, so that the land was darkened; and they did eat every herb of the land, and all the fruit of the trees which the hail had left: and there remained not any green thing in the trees, or in the herbs of the field, through all the land of Egypt.

Other interesting passages about locusts may be found in the Bible and the Apocrypha. The Midianites and their allies are as grasshoppers for multitude (Judg. 6:5, 7:12), and so are the inhabitants of the earth (Isa. 40:22). Of the forces under Nebuchadnezzar, Judith (2:20) says: "And a great company of sundry nations went forth with them like locusts, and like the sand of the earth; for they could not be numbered by reason of their multitude."

Efforts are still being made to indicate adequately the size of flights of locusts. They darken, eclipse, or shut off the sun and becloud the sky. They come "in clouds, like the drifting smoke of a prairie fire." They form "a yellow canopy over the land."

Homer's lengthy simile (*Iliad*) in which he likens the Achaeans leaving their huts and ships to bees issuing from their hives has had so much influence on later writers that I am quoting it in full:

> Even as the tribes of thronging bees go forth from some hollow rock, ever coming on afresh, and in clusters over the flowers of spring fly in throngs, some here, some there; even so from the ships and huts before the low sea-beach marched forth in companies their many tribes to the place of gathering.

Obviously influenced by this passage, both Apollonius Rhodius and Quintus Smyrnaeus incorporate long similes about bees in their poems. Although they emphasize the similarity of the actions of bees and human beings, the idea of large numbers seems implicit in their wording.

Vergil, too, has a passage about bees. In the *Aeneid* the ghosts of innumerable tribes and peoples hover about the banks of Lethe like bees settling upon many-colored flowers in the serene summer.

Pope is indebted to the classics (and doubtless to the Bible also) in these lines from the *Dunciad*:

> Millions and millions on these banks he views,
> Thick as the stars of night, or morning dews,
> As thick as bees o'er vernal blossoms fly. . . .

Comparisons with swarms of bees have been common throughout the ages. In the Bible (Ps. 118:12) the psalmist says that all nations compassed him about like bees. Aeschylus likens the Persians under Xerxes to a swarm of bees. In the Korean War the Chinese "swarmed" up the hills at the battle front. At present "swarm" is used so freely of persons and

things that we do not always think of bees when we hear the word.

FLIES

Homer tells us that the Achaeans before Troy were as numerous as the persistent flies that hover about the milk pails in spring, and he uses the same comparison to describe the throng about the corpse of Sarpedon.

Centuries later Milton (*Paradise Regained*) adapted the comparison to his own needs:

> Or as a swarm of flies in vintage-time,
> About the wine-press where sweet must is poured,
> Beat off, returns as oft with humming sound.

Pliny the Elder uses "cloud of flies," a phrase that, to my mind, conveys the idea of a great number better than does "swarms of flies," which, in the Bible (Exodus, chap. 8), is applied seven times to one of the plagues of Egypt.

VEGETATION

A section of this paper has already been devoted to leaves, and mentions of flowers, fruit, grapes, grain, and grass have appeared incidentally; but a few more examples from the vegetable kingdom may be noted here.

In Lycophron fields bristle with spears as if they were fields of grain. Catullus is thrilled by the beautiful eyes of a young boy, a favorite of his. He thinks he would not be satisfied with kisses *usque ad milia trecenta*, nor would he be sated if the crop of kisses should be denser than ripe ears of corn.

A threefold comparison to grain, leaves, and sand is made by Ovid, who seems to allow room for none but futile dreams

in the realms of sluggish sleep, a deep recess in a mountain near the land of the Cimmerians:

> Somnia vana iacent totidem quot messis aristas,
> Silva gerit frondes, eiectas litus harenas.

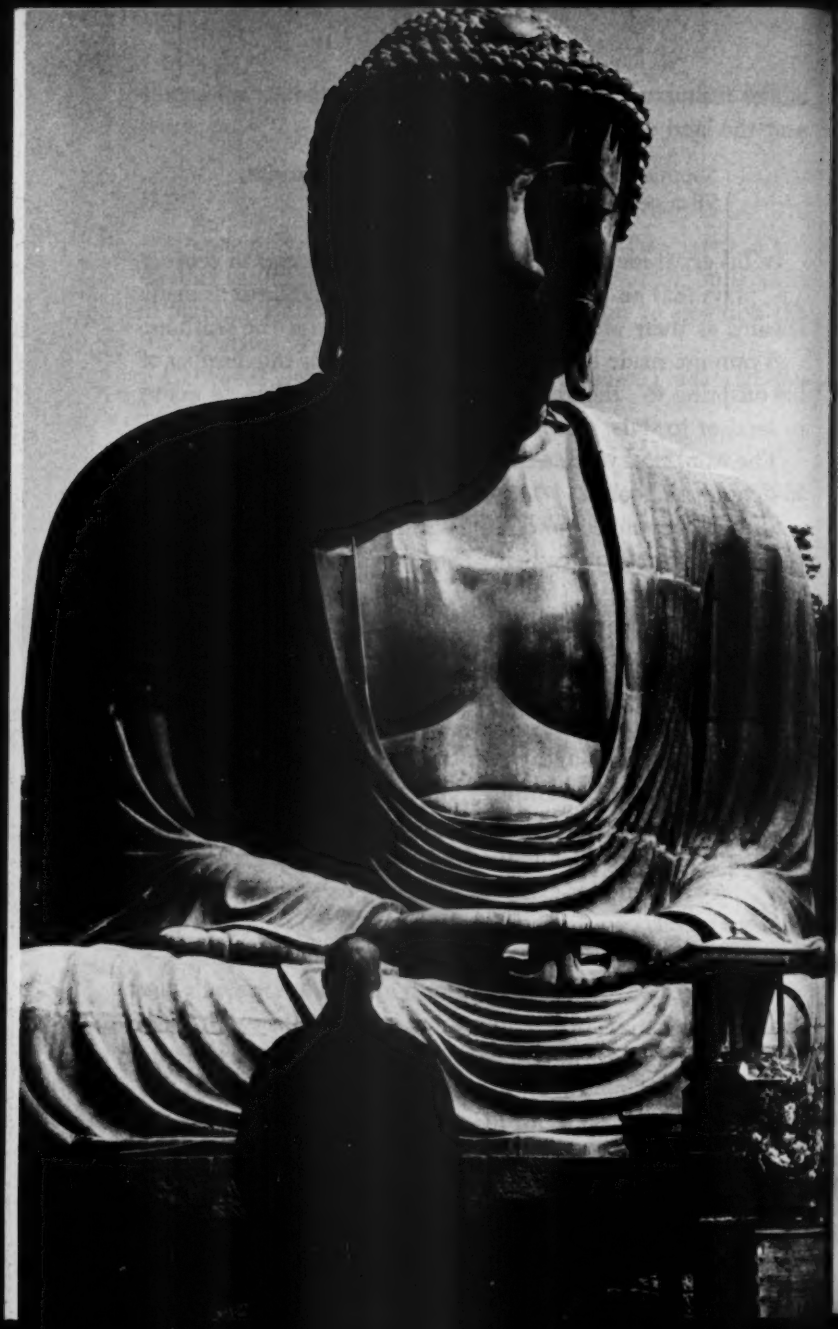
In his gratitude for kindnesses Alcuin, in the eighth century A.D., prays that his benefactor may receive from Christ as many rewards as there are blades of grass or sands on the seashore.

A promise made to Job (Job 5:25) compares the number of his offspring to "the grass of the earth" rather than to grains of sand or to stars.

The word *silva* is often used metaphorically by Latin authors to denote abundance.

Such usages are common in English also, as these examples suggest: "a forest of feathers" (Shakespeare, *Hamlet*); "a forest huge of spears" (Milton, *Paradise Lost*); "a boundless wilderness of spears" (Scott, *The Lord of the Isles*); "grove of spears" (W. Irving, *The Conquest of Granada*); "the forestry of masts" and "a wilderness of steeples" (Byron, *Don Juan*); and "forests of bayonets" (Whitman, *Leaves of Grass*).

Countless articles and books trace and evaluate the indebtedness of modern literature to Greek and Roman authors. It is obvious that ancient methods of indicating large numbers have had considerable influence upon later writers, even after allowance is made for examples that originated independently and are merely counterparts of classical usages.



Don't judge other religions by your own, the author told himself before setting out for the Far East. But even he, equipped so objectively beforehand, found this easier to preach than to practice!

On Understanding Non-Christian Religions

By ERNST BENZ

When I was invited to be a guest professor at Doshisha University in Kyoto, Japan, I felt I was well equipped to understand the high religions of Asia.

I had spent many hours discussing this subject with the late Joachim Wach, professor of the history of religion at the University of Chicago, and author of the famous *Sociology of Religion.*

Wach was concerned with the historical and systematic study of the world's religions. The goal of his research was always the *interpretation* of religions, especially the non-Christian high religions of Asia in their ethical and social, their liturgical and aesthetic, as well as their theological forms in expression.

During our conversations, Wach often told me about the deep impression that the contact with the living forms of religious expression in modern Islam and Hinduism had made on him during his travels in Morocco and India. He emphasized repeatedly the enormous value of this kind of personal contact with the contemporary religious forms for the student of religion who ordinarily studies these forms only from literary documents belonging largely to the historical origins or early classical epochs of these religions.

When the invitation from Doshisha University came, I felt I was well prepared for my experience in Asia. I had worked out lectures in English for the extensive teaching activity awaiting me en route. I was to lecture at universities in India, Ceylon, Burma, Thailand, and at my host university in Japan, as well as at numerous other Christian, state-supported, and Buddhist universities. For this task, I tried to orient myself inwardly for the intellectual and religious conditions under which I had to teach. I also acquainted myself with the professional literature of the science of religion concerning, especially, contemporary Hinduism, Buddhism, and Shintoism.

"Understanding" had not been a real problem to me during this time of preparation. From my ecumenical studies and works, I knew the various intellectual, liturgical, constitutional, and social forms of expression adopted by Christianity in the various churches and sects in the past and the present. I had studied with the Eastern Orthodox church for some decades, and visited its monasteries on Mount Athos, in Constantinople, in the Balkans, and in Russia from Kiev up to the Valamo Monastery at Lake Ladoga. For months I had lived in Orthodox surroundings. After these experiences I was confident that I would also find an inner access to the forms of religious life in Hinduism or Buddhism. . . .

The problem of understanding, however, assailed me like an

enemy. I had never anticipated how difficult the task of translation, for example, would be. While translating my own lectures into English, I realized how hard it is to reproduce in English theological concepts and religious experiences originally expressed in German.

But this difficulty of translation of one European language into another is a simple matter compared to the attempt to translate a European language into an Asiatic one. Since I myself did not know any of the Eastern languages fluently, I was protected by my friends and hosts against some gross misunderstandings, for I always had the best interpreters at my disposal. I would always pass on to my interpreters the English version of my lectures so that they had the opportunity of becoming familiar with my material and preparing an adequate translation. Nevertheless, I repeatedly felt like the Rider on Lake Constance when I had read my English text and then listened to the interpreter delivering it in Singhalese, Burmese, Siamese, or Japanese. I had not the slightest possibility of controlling what he was telling my audience.

Some American colleagues, who had already experienced these difficulties, recommended a kind of test method. One such test was to insert a joke in the lecture occasionally. If the audience laughs when the joke is translated, the speaker may assume that the interpreter is doing his job faithfully. But even this rather crude method yields no certain proof among Asian peoples. Sometimes the audience smiles or laughs at points in the translation where in the original manuscript there is not the faintest cause for humor. Such experiences make a speaker feel so uncertain and so helpless that even the best "joke test" fails to reassure him. . . .

As I came to understand the essence of one non-Christian religion, it became at once increasingly clear to me to what extent and to what degree of depth our Western attitude, our

intellectual, emotional, and volitional reaction to other religions, is modified by the European Christian heritage. It is one of the basic rules of the phenomenological study of religions to avoid judgment of other religions by criteria of one's own. However, I was repeatedly surprised by how difficult it is in practice to observe this rule.

Our scientific-critical thinking, our total experience of life, our emotional and volitional ways of reaction, are strongly shaped by our specific Christian presuppositions and Western ways of thought and life. This is true even as regards the pseudo-forms, and secularized forms of thought and life, which are antithetical to the claims of Christianity. Indeed, we are frequently, in most cases even totally, unconscious of these presuppositions. Permit me to mention three points in this connection.

1. Our Western Christian thinking is qualified in its deepest philosophical and methodological ideas by a personalistic idea of God. This concept makes it particularly difficult to understand the fundamental disposition of Buddhism, which knows of no personalistic idea of God. The traditional Western reaction, in Christian theology as well as in Western philosophy, is to characterize Buddhist theology as "atheistic." It is difficult for a Westerner to comprehend the specifically Buddhist form of the approach to the transcendent. As for me, I had theoretical knowledge, from my acquaintance with Buddhist literature, of the non-theistic tenets of Buddhism. But it became clear to me only when attending Buddhist "worship services" or in conversation with Buddhist priests and lay people. It is difficult for us to understand the non-theistic notion of Buddhism because the personalistic idea of God plays such a fundamental part in our Western logic. It took constant effort and new trials on my part to realize that the basic difference between the two is not one of abstract theo-

logical concepts. It goes deeper than that, because this particular form of expression is attained by a certain training in meditation. It is here that the experience of the transcendent is cultivated and secured for the total life of Buddhism.

From Christian lecterns and pulpits we hear proclaimed in noisy and confident terms detailed information concerning the essence of God, the exact course of his providential activity and the inner life of the three Divine Persons in the unity of the divisive substance. But the reverent silence of the Buddhists before the "emptiness" of the transcendent, beyond all dialectic of human concepts, is pregnant with its own beneficence.

Buddhist art was the most important help to me in overcoming this intellectual "scared-rabbit" attitude toward the theological "atheism" of Buddhism. I was especially impressed by the representations of Buddha himself in the various positions of meditation. Our traditional theological ideas and concepts of God are a serious obstacle in understanding the Buddhist forms of transcendental experience. At best, Meister Eckhart's idea of the divine Nothingness or Jacob Boehme's notion of the Non-ground (*Ungrund*) in God may serve as bridges of understanding from a Christian experience of the transcendent to a Buddhist one.

2. Hindu and Shinto polytheism confronted me with still another problem. I simply felt incapable of understanding why a believer preferred just one god or goddess among the vast pantheon. What attracts the wealthy can manufacturer of Kyoto to the shrine of the rice-god Inari and causes him to donate whole pyramids of his cans and his pickles? I saw such offerings literally piled up beside other pyramids of rice-wine casks and cognac bottles which other dealers had donated to the god of this shrine. In the Shinto pantheon of eight hundred thousand gods this singling-out of one of them was a real

enigma to me. What moves the devout Hindu to pass by the Kali temple and the Vishnu temple on one day and hurry to the sanctuary of Krishna to offer him his sacrifice of flowers and his prayers and to participate the next day in the Kali festival? In the mind of the devotee what role does the individual god play beside the other gods? Our understanding of all these problems is blocked by many factors. Consider, for example, the vigorous denouncements by the Old Testament prophets of idols and idolatry among the ancients. Consciously or unconsciously, the modern Christian is influenced by such traditional attitudes. Nor can he fully appraise the strength of these attitudes if he reduces them to theological arguments. The battle waged against polytheistic practices by the Mosaic and Christian religions must be seen as a total emotional response which penetrates our attitudes more deeply than any intellectual affirmations.

Even the various European renaissances of classical antiquity have not appreciably changed this. We are still accustomed to seeing the ancient abode of the gods in the light of the poetic transfigurations of humanism and classicism. This whole world of gods defamed by Christianity flares up once again in a kind of aesthetic romanticism. But these gods are for us at best only allegories. We are no longer able to imagine the religious significance that they had as gods for the faithful who prayed and sacrificed to them.

In Asian lands, however, polytheism is encountered not as literary mythology but as genuine religious belief and as living cultic practice. It appears in an overwhelming diversity and at the most varied levels of religious consciousness. As in the Hellenistic religions of late antiquity, there occurred also in India a development toward monotheism. The Hindu deities Krishna, Vishnu, Kali, and others were worshiped as manifestations of Brahma, the one transcendental God, the Hindu God,

much more reverently, however, than was the God of Plotinus, because the Hindu religion presupposes a plurality of worlds as over against the geocentric narrowing of the world picture of classical antiquity.

This development is the result of a profound change in the religious consciousness of India. In Shintoism, however, this change has not yet occurred. Its eight hundred thousand gods have hardly been put into hierarchical order, each god being a particular manifestation of the Numinous by itself. While visiting Shinto shrine festivals, I often asked myself what moved the Shinto faithful to prefer this or that particular god, to sacrifice to him and worship him in a special way. (The shrines require rather substantial sacrifices after all state support has been withdrawn.) To seek the answer to this question in custom or convention in the relationship of certain occupational groups to certain deities is only to put off the question. Rather it seems to be the case that one worships the divine in such form as it has emerged impressively and effectively in one's own life, whether it be as helper, as bringer of luck, as protector and savior, or as a power spreading horror and awakening fear. It is the experience of the *numen praesens* which is primary and decisive for cultic devotion. Manilal Parekh, in his book on Zoroaster, puts this thought into an excellent phrase when he writes of the devotees of the Rig-Veda epoch: "They invoke a god because they need something from him, and for the time being he fills all their horizon. Thus it happens that there is no god who is supreme in this pantheon."

I asked my Shinto friends repeatedly: What is the essence of Shintoism in the veneration of the numerous gods at the various great and small shrines? One of them, a priest at a Shinto shrine, answered that it is the devotion to the creative forces in the universe in the bodily, the cosmic, the ethical, the intel-

lectual, and the aesthetic realms. This answer doubtless meets the most important point.

Decisive for this stage of the religious consciousness is the encounter with the self-realization of the transcendent in its individual form and expression of power. This encounter is the crucial factor, whether it occurs on a holy mountain or at a holy tree or fountain or in the meeting with an ethical hero. Correspondingly, the world of the gods is never finished; only the dead polytheism of our classic literary antiquity is "perfect," its Olympus complete, and philologically conceptualized. Living polytheism constantly creates new gods.

One of the most important Shinto shrines is dedicated to the veneration of General Nogis, who in 1921 committed a demonstrative hara-kiri which was consummated in all the liturgical forms of religious self-sacrifice. By his act the dangers of Westernization were called to the attention of Japanese youth who habitually sense, recognize, and worship the transcendent in constantly new forms of appearances. It is precisely from Shintoism that in recent times there have emerged not only new gods but also new religions. Living polytheism, therefore, is extraordinarily flexible and is open to systematization and a hierarchical organization. It is also capable of being accommodated to the various high religions, as was the case in the monotheism of the Vedas and also in Buddhism. Only Judaism understood the idea of the unity of God in the exclusive sense that all other gods beside Yahweh are "nothing." In the tradition of Jewish monotheism the Christian church has used the exclusive interpretation of the unity of God to denounce the non-Christian gods of its neighbors as demons and to abolish their cults. Christian theology itself has screened the Christian doctrine of the Trinity, sometimes interpreted in a polytheistic sense, in such a way that the understanding of genuine polytheism was no longer possible.

3. The third point is that Hinduism, like Buddhism and Shintoism, lacks one other distinction so fundamental for our Christian thinking: the belief in the basic essential difference between creation and Creator. For our Western Christian thought this absolute discontinuity between Creator and creation is normative, but it does not exist in Buddhism and Shintoism. The same central importance that the idea of the absolute otherness of Creator and creation has for us, the idea of the unity of being has within Buddhist and Shinto thought. This idea of unity not only is connected with the particular method of direct religious experience, meditation, and vision but also has a bearing on logic and conceptualization even where they are wholly unrelated to religious experiences as such.

Many other points might be mentioned in this connection, such as the relationship of man to nature, to the universe, and especially the idea of deification. It is baffling to the visitor from the West to note again and again how in the Eastern religions outstanding personalities are swiftly elevated to the rank of god or recognized and worshiped as incarnations of certain divine attributes. This, however, only surprises one who holds the basic Western presupposition of the absolute discontinuity of divine and human existence. Viewed from the idea of the unity of existence, this step is self-explanatory, just as the impassable gulf between Creator and creation is self-evident to us.

Another basic assumption which we hold as part of our Western Christian thinking is the common preference we attribute to theology, the doctrinal part of religion, when it comes to the interpretation of the forms of religious expression. But this preference is a specific sign of Christianity, especially Western Christianity of the Protestant variety. Whenever this viewpoint has been applied to the critical examina-

tion of Asiatic religions, an emphasis on their didactic and doctrinal elements has resulted. Thus, in interpreting Buddhism and Hinduism, some Western authors have placed undue stress on their teachings and philosophy.

I myself was extremely surprised to find that in contemporary Buddhism a much more central role is played by its liturgical and cultic elements. One element of religious life which has almost completely vanished from religious practice in Western Christianity, the exercise of meditation as a spiritual and ascetic discipline, is accorded a tremendous importance in Buddhism. This became clear to me only as I had the opportunity of seeing it firsthand.

Meditation in Buddhism is not the privilege of a few specialists but a practice directly shared by the majority of Buddhist lay people. To this day it is assumed in Buddhist countries that, before taking over an important position in government, administration, science, or elsewhere in the social and military life, men must have undergone some training in meditation. Today it is still customary among many educated Buddhists to spend their vacations as temporary novices in a monastery and to give themselves to meditation. In Hinduism, too, meditation is still very much alive and is practiced in an astounding variety of forms and methods, because most of the great gurus and founders of ashrams have developed their own form of meditation and Yoga and transmitted it to their disciples.

The importance of Eastern meditation has gradually been recognized in the modern Western literature on the science of religion and elucidated in various technical studies. However, the whole vast area of the symbolic language of Eastern religions as well as their liturgy and cults has hardly been noticed. I was surprised over and over by the power of the symbol in Buddhist worship services. Symbolic details were often explained to me by obliging priests. Especially in Buddhism

does this symbolic language appear highly inaccessible. Above all, the symbolism of the movements of hands, arms, and fingers is very strongly developed. This hand-and-finger symbolism has in Eastern religions been brought to high perfection in two fields. It plays a role in the liturgical dances of India, where to this day a large number of symbolic hand and finger movements (*mudras*) have been preserved. It also figures in the practice of meditation and in the cult of two Buddhist schools, the Tendai and Shingon schools. Within the esoteric tradition of these schools, hand-and-finger symbolism was cultivated to an incredibly skilful and complicated system of expression which makes it possible to express through finger-and-hand symbols the whole content of the school's secret doctrine in one worship service. Just as significant are the symbolic positions of one's body, hands, and fingers during meditation. This is so because the person meditating puts himself into the position corresponding to the position of Buddha or some Bodhisattva on his way toward attaining full enlightenment.

It is often said that the religious life of Christianity is not confined to its teachings and its theology. This is certainly even more true for Buddhism, which, in essence, is practiced religion, practical meditation, symbolic representation, and cultic liturgical expression.

The Western Christian also must be aware of transferring to the Eastern religions his own ideas concerning the organization of religion. We always assume more or less consciously the ecclesiastical model of Christianity when analyzing other religions. This approach suits neither Hinduism nor Buddhism nor Shintoism. The Japanese Buddhists do not form a Buddhist "church." Buddhism is, in fact, represented by a diversity of schools with their own temples and monasteries and their own educational institutions and universities. These are

not co-ordinated in any organizational fashion. Moreover, within the individual schools there is only a minimal organizational connection between the temples and monasteries. They are basically autonomous and economically independent units. A Buddhist federation was only recently formed in Japan. This, incidentally, was inspired by the formation of the "Buddhist World Fellowship" in connection with the Sixth Buddhist Congress in Rangoon in 1954–56. But its concern is merely the representation of common interests among the different Japanese and Buddhist groups. It has nothing to do with ecclesiastical organization.

It would be equally misleading to apply to Eastern religions the idea that a person can be a member of only one religious community. This is a notion which stems specifically from confessional Christianity. It does not apply to Japan, or to China, where in the life of the individual Taoism, Confucianism, and Buddhism mix and interpenetrate, as Shintoism and Buddhism do in Japan. The Japanese is a Shintoist when he marries, since the wedding ceremony is conducted by the priest at the Shinto shrine; and he is a Buddhist when he dies, since the funeral rites are conducted by Buddhist priests, the cemeteries are connected with Buddhist temples, and the rituals for the souls of the dead are held in Buddhist temples. Between the wedding and funeral, the Japanese celebrates, according to private taste, preference, and family tradition, the Shinto shrine festivals and the Buddhist temple festivals.

After the occupation, when the Americans took a religious census in connection with the religious legislation carried out by them, it was found, to their great surprise, that Japan, with only 89,000,000 inhabitants, registered 135,000,000 as the number of the faithful of all religious groups. In point of fact, there was no fraud involved. The curious surplus of religious adherents had resulted from individuals registering as mem-

bers of both Shinto and Buddhist temple communities. For this reason they appeared twice in the religious census. The "Pure Buddhism" mentioned in our textbooks of the history of religions does not exist at all. For even in the various Buddhist centers of meditation and teaching, Buddhism is amalgamated with various levels of religious consciousness expressed in local mythologies.

I had occasion to attend the celebration of the consecration of a Buddhist priest. According to the ritual, the newly consecrated priest first offers his obeisance to the Sun-Goddess Amaterasu and afterward to the person of the Emperor. This type of connection between Buddhism and Shintoism occurred in Japan as early as the eighth century. It followed from the teachings of Kobo-Daishi, who in his sermons taught the people that the Shinto gods are identical with the Bodhisattvas of the Buddhist doctrines. This identification occurred not only on the intellectual theological level but on all levels of the liturgy, the cult, the religious symbolic language, and the mythology. It led to practical forms of conduct which cannot be judged by criteria of dogmatic thought and the division of religions on a doctrinal basis.

Another aspect of Eastern religions which was difficult for me to understand was that of magic and sorcery. I came into contact not only with exorcism and sorcery but also with forms of magic in cultic dance, words, writings, and pictures. Here the Western Christian finds access to a wide dimension of religion otherwise completely barred to him by his own tradition. Christianity denounced the whole aspect of magic as "demonic" and banned it from the realm of Christian faith. This is just another of those surprising examples of how in Hinduism and Buddhism all levels of religious consciousness and all varieties of religion continue to exist side by side and to intermingle with each other. The European observer always

feels himself pressed to create divisions and differentiations. Hindu friends of mine have observed that many European visitors interested in Hinduism ask the same question. Observing the devotion of Hindus in their temples, they ask, "How is it possible for such variant and mutually exclusive opposites to exist side by side in Hinduism?" Together with the highest spiritual and ethical form of monotheism and the most elevated form of asceticism and of meditation, they are amazed to find such primitive sorcery and magic as might be seen in African fetishism. The Hindu's answer to this question will always be that such things are not at all mutually exclusive opposites but represent stages in the development of religious consciousness.

There is a similar situation in Buddhism. Many of the cult rituals that I was permitted to attend were based on completely magical notions. I was particularly impressed, for example, by the new year's service in a Zen monastery. On three consecutive days the festival of the so-called Daihanya, the physical turning-over of books, was celebrated. The basic idea of this festival is to set into motion the total content of the teachings of Buddha. But since this doctrine fills about six hundred volumes, it is quite impossible for a small monastic community to recite it in its entirety in one service of worship. Such a recitation of the canon could only take place at an occasion such as the Sixth Council of Buddhism, where thousands of monks were occupied for a long period of time reciting the sutras consecutively.

Instead, at the Zen monastery, the spiritual moving of the content of the six hundred volumes is magically accomplished by moving them physically. Piled on a low table in front of each monk are some ten to fifteen volumes of the canon. During the worship service each one of the volumes, written on a continuous folded strip, is unfolded like an accordion and

folded again with a fluent ritual movement. The monk swings it briskly over his head while he calls out its title and first and last line. The idea is that through this physical motion the spiritual content of the books is actually set into motion. This liturgy counts as particularly meritorious, both for the liturgists themselves and for other Buddhists too.

For our Western thinking it appears absurd to set into motion the spiritual content of a book by liturgically leafing through it. We no longer have a sense for the meaning of magic, any more than for the difference between black and white magic. The peculiar basic assumptions on the relationship of spirit and matter underlying this idea are foreign to our thought and difficult for us to comprehend. These assumptions operate on a still more primitive level in the system of Buddhist-Lamaist prayer mills. This system consists of producing the spiritual content of a prayer through physical movements of the parchment on which the prayer is written.

It was equally difficult for me to understand the practice of sacrificing and its meaning. The ultimate emotional and spiritual motives for a sacrifice, the estimated value of a sacrifice, the enormous variety of sacrifices (sacrifices of flowers, incense, drink, animals, all with manifold liturgical and ritual variations), are extremely hard to fathom. This whole world is one which is largely closed to Europeans, especially to those of Protestant persuasion. It is a world to which we lost access centuries ago. The abyss separating us from the ancient idea of sacrifice cannot be bridged simply by an intellectual jump. There are, however, a few European philosophers of religion whose work is significant here. In studying the various types of sacrifice in the history of religions, Franz von Baader, for example, has been able to understand something about the mystery of sacrifice.

One other danger of misunderstanding lies in evaluating the

Buddhist priest ordination. Neophyte priests have rice begging bowls slung from their shoulders.

mission of non-Christian religions. Here, too, Western observers are easily inclined to presuppose the Christian form of mission and propaganda, and its methods and practices, among the non-Christian high religions. Such assumptions can lead only to misunderstanding. It is true that a certain analogy exists between the expansion of Hinduism and Buddhism, on the one hand, and the mission of Byzantium and of the Nestorian church of the fifth to the tenth centuries, on the other

hand. The basis of mission here is not, however, a missionary organization but the free and partly improvised activity of charismatic personalities who, as itinerant monks, counselors, and teachers, collected a group of disciples around them. As a rule, this type of activity is related to the formation of monastic centers. In Hinduism we note the appearance of individual leaders who founded ashrams, and from these ashrams began missionary expansion or reform activity. In the same way the history of the expansion of Buddhism is most strongly connected with the appearance of such charismatic personalities. As itinerant preachers and founders of monastic communities, these men contributed their own particular forms of teaching and meditation. It has been only in very recent times that Buddhism adopted an organized mission activity. In this case, it is significant to note that the model for its methods of propaganda, as well as for its organization, is furnished by the organization and method of the Christian world mission.

Contrary to what may seem to be the case in this essay, my purpose here has not been to reproach or intimidate. I have enumerated some of these problems because I believe it is essential to clarify them if we would advance toward a better understanding of Eastern religions.

Allow me to make a personal confession here in conclusion. What has repeatedly comforted me most in this work was the thought that we carry within ourselves the most essential condition for the understanding of other religions. In the structure of the human personality there is doubtless a tradition of earlier forms of religious experiences and of earlier stages of religious consciousness. Christian theology has succeeded in displacing most of these archaic ideas but has not been able to remove from our heritage those earlier stages of religious consciousness.

Here in Germany, for example, we look back upon some

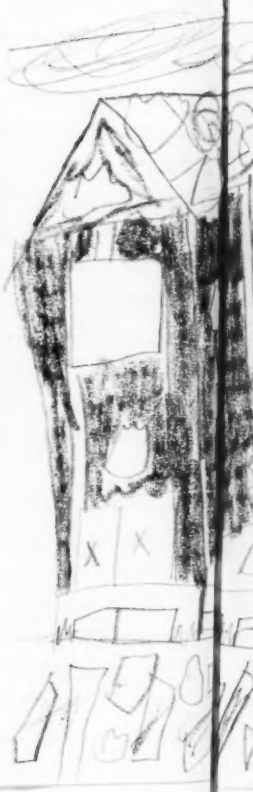
thirty generations of Christian tradition. It goes without saying that the religious ideas and experiences of these generations were shaped in a more or less Christian way; but behind them lie, if mankind is really 6,000,000 years old, as anthropologists have reason to assume, 180,000 generations whose religious consciousness has run through all stages of animism and polytheism. It would be nonsense to assume that the experience of these early peoples has had no decisive effect on the spiritual and moral development of present-day mankind, as also on Christians of our own times. Somewhere in the bedrock layer of our religious awareness the religious experience and various conceptual forms of our primitive forefathers live on. Somewhere in us also lies the heritage of the sibyl and of the haruspex; in some hidden corner we still harken to Pan's flute and tremble at the sound of the sistrum. Our aversion to horse meat is probably due to Christian influence and is still not quite overcome. It lingers as a strong reminder of the sacred appetite with which our forefathers consumed the sacrificial horse thirty generations ago. We cannot separate ourselves from the experience and ideas of the countless generations behind us.

To Buddha in the night of his illumination under the bodhi tree was revealed the insight into all his earlier incarnations. For myself I covet another intuition: a clear insight into the earlier stages of the religious consciousness of mankind. I should like to know the way in which man has passed through these stages up to the present and how they lie submerged in the depths of our humanity in some form that is now barred and veiled from us. This is not the same as the desire to return to these stages. It is rather a wish to know the inner continuity of meaning in the development of the varied forms and stages of religious consciousness. And this desire does not seem to me to be non-Christian.

For if history is in a sense the history of salvation, then this history cannot have begun with Moses in 1250 B.C. The history of salvation is as old as the history of mankind, which we assume is some 6,000,000 years older than Moses. And if this is so, then the history of religions and the history of the development of the religious consciousness must be seen as coterminous with the history of salvation. If the revelation in Christ is really the fulfilment of time, then it must also be the fulfilment of the history of religions. Then, also, the earlier stages of religion which mankind passed through stand in a meaningful and positive relation to this fulfilment of time and of the history of mankind. On this basis, one of the most important tasks of contemporary Christian scholarship would be to set forth a new theology of the history of religions. The way would then be open to a real "understanding" among the religions of the world, as Joachim Wach envisioned it.

You magen, some houses
fell to peaces, others rocked
back and forth, and some
went up in the tree tops.
All was a mess.
Beauty's barn was full
of holes and glass was
out of the windows and
boards were off. Things
fell inside and hit some
horses on the head.

7



From the novel "Beauty Finds a Friend," by Cynthia R. White, eight years old, of Pompton Lakes, N.J. This is one of two books by this young author-artist.

What can be done in the elementary school to encourage better writing?

Separate content from mechanics advises an experienced language arts teacher.

Let's Teach Children To PROOFREAD

By MILDRED LETTON WITTICK

For some time the high schools have been under pressure from the colleges to improve the writing of their graduates. Parents and educators as well as students have been unhappy about the large number of failures in freshman composition.

Now comes word that, beginning next year, each student who takes the college entrance examination conducted by the College Entrance Examination Board will be required to write an essay. Applicants will be allowed an hour to write a paper three pages long.

The Board plans to send a copy of the essay, not scored, to the college where the student is applying. Each college will thus have an example of the student's writing to consider in deciding on admission.

As high schools become more concerned with writing, they are likely to expect more of the elementary school. What can be done to encourage better writing?

First of all, we might give our pupils more opportunities to write. If one learns to write by writing, it is easy to see why many of our young people write badly. Not long ago I met a bright high-school senior who was about to graduate. During the past four years this student had written only one composition!

Next, when teachers are considering a pupil's writing, they will be wise to separate content from mechanics of expression. The practice might well be followed by teachers at all levels.

The child who is constantly penalized for errors in spelling and punctuation soon learns to limit himself to simple words, short declarative sentences, and brief paragraphs. He loses his curiosity about words and his desire to experiment with language. Unfortunately, the isolated exercises on mechanics of expression in textbooks and workbooks have little effect on the child's ability to communicate in writing.

The teacher's first obligation is to deal with content. For boys and girls in the primary grades there is so much to learn, so much to explore, that children usually have a great deal to say and they say it in fresh, uninhibited style. The teacher proffers help as it is needed, and here, too, the emphasis should be on content. Too often in the middle grades the attention shifts to mechanics, and the child's writing becomes less spontaneous and more labored.

The other day I saw a thirty-two-page "book" that an eight-year-old had written at home. The book had the conventional format. Table of contents, chapter titles, page numbers, illustrations—the young author had included them all, and she had made surprisingly few errors in spelling or punctuation.

The main character was a horse who let the cows get into

their "stanshuns" in the barn during the day. Unpenalized for spelling errors, the young writer was able to use the right word and proceed to tell her story, undismayed.

This book was never taken to school. Many a child who likes to write reserves his longer and often best efforts for out-of-class time when he can concentrate on content. Perhaps you, too, once wrote a masterpiece for your own private enjoyment.

Last fall under a Washington date line the Associated Press sent out a release on a child's writing, a letter sent to Secret Service Chief U. E. Baughman by a boy who lives in a small, unnamed city in Kentucky:

> You may not be reading this letter but who every is I want to tell them that I am sixth grade boy who is very impressed with there job and duties.
>
> I have just finest reading a book about some of your duties. I won't to tell you how much I appreciated your never ending job of prtecting the President, guarding against counterveiting, and forging checks and other such end less jobs.
>
> If you every come to my town escorting the President you might see a boy with a big smile on his face cheering with the crowd. That boy will be me. I will be cheering for you the men who protect the President as well as th president.

The AP story goes on to report that the Secret Service asked that "the letter-writer not be identified, partly because his teacher might take him to task for his spelling."

A study of the letter shows that some of the errors could have been corrected by proofreading. "Protect" in the last paragraph seems to indicate that "prtecting" was a careless error. Some of the misspelled words are spelled the way this boy probably hears and pronounces them.

If I were his teacher, I would not be ashamed of the letter. The child had the initiative to write, and the letter he wrote was sincere and straightforward. He spelled a high percentage

of the words correctly; he used an appropriate vocabulary; his sentences are interesting and varied in structure. With a little help this boy could make his letter a first-rate piece of writing for a child in sixth grade.

As language-arts teachers, it is not always easy for us to remember that writers need many experiences before spelling and punctuation become automatic. Some individuals never attain such mastery. Vincent Sheean, in the New York *Herald Tribune Book Review* of October 18, 1959, said of an author:

> She has some queer and undefinable talent for words, is steeped in English poetry, loves all life with a passion, and in the result can tell her tale far better than any professional writer might have done. . . . Spelling and punctuation—in which she is unashamedly deficient—have been put in order, but otherwise these recollections bubble and foam and pour over the rocks of memory in her own language and style, as true and unmistakable as the waterfall or the mountain sunrise. And when you come right down to it, this is the true stuff of writing: we must all remember, with humility and wonder, that Virginia Woolf couldn't spell or punctuate either.

This is not to suggest that errors in mechanics of expression are to be condoned, but rather that we should work with children on errors they make in real writing situations. We have the delicate three-way task of making the writing a learning experience for the child, giving him a personally satisfying experience, and putting aside the temptation of overwhelming him with his errors.

Let us look at another writer's effort. One afternoon the eighth-graders in a classroom were asked to describe what they had seen when they walked home from school and back again after lunch. Some pupils wrote descriptions of houses, yards, pet animals, or people. A few children described activities in their neighborhood. Then the teacher came to Michael's paper. If this paper were turned in to you, what would you do?

ME AND THE GARBAGEMAN

During the lunch hour I usually go by my friends store.

He is a photographer named Joe S——. It is only two blocks from school so there isn't very much to see.

I was walking to my friends store. In front it was a white Garbage truck and the Garbage was emptying the barlles of Garbage. I was watching him and then noticed a nylon stocking over his head. Because I was looking at him he said, "What are you looking at." So I asked what the stoking was for. He said it was to keep the Garbage of his hair. Now I know what Garbage men wear stokings over the heads for.

Just as I was walking away I stared laughing because he was bald.

As I was to school I saw in the window of the cleaners a sign that said: "Free Goldfish".

So I stoped in and asked about it the man who ownes the store said that if you spend $15 by Dec. 15, 1959, you get 2 goldfish, a goldfish bowl Gravel seaweed and food. I thanked him and kept on walking to school.

Is this paper illiterate for an eighth-grader? What about the content? Surely it has a definite style; it is entertaining. The writer is a keen observer and is in close contact with his neighborhood world.

Can this writing be salvaged? Being optimistic, I would say yes, and try. First of all, only a few words are misspelled, only about 4 per cent, statistically speaking. He misspelled *stocking* twice, but he had it correct once. Proofreading would have caught several of the gross errors. Although he had problems in punctuation and paragraphing, he showed some knowledge of the use of quotation marks.

I would want to ask Michael about his title. Why did he word it as he did? I would want to find out why he capitalized *garbage* in the body of his material. I might also want to ask him how he happened to know that the garbageman was bald

when the man apparently was wearing a nylon stocking on his head.

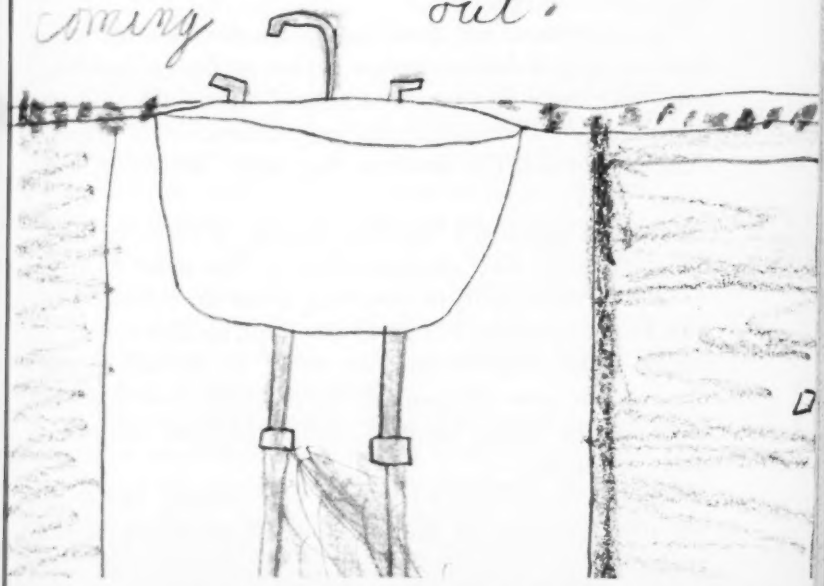
In working with Michael, it might help to point out that the kinds of errors he made interfere with the communication of his ideas to the reader. Often pupils in the upper grades fail to realize that spelling and the accepted mechanics of expression, as well as language itself, are man-made. It is because we have regularized spelling and mechanics that we are able not only to communicate with one another but to understand the past as well.

Even the young writer must see and feel before he writes. Edgar Dale, in the *News Letter* (Bureau of Educational Research and Service, Ohio State University, Columbus, Ohio) for October, 1959, mentions an article by Edward Vernon in the *British Weekly*. Vernon asked children to prepare an answer to the question, "What are the loveliest things you know, persons not counted?" Here are some of the children's answers:

FROM GIRLS	FROM BOYS
The scrunch of dry leaves when you walk through them	A mounted policeman's horse
An organ playing	The feel of a dive
Rain on your cheeks	Looking into deep clear water

"We could learn something very important by noting how little children see the world with a questioning, innocent eye," Dale writes. "A three-year-old picks up and gravely examines a robin's egg that has fallen from a nest. He is in no hurry; he takes his time lest something escape him. He sees the world in a fresh, pristine way.

So the plumming man came and found all the water over the floor and still more coming out.



Page 14 from "Beauty and the Cow Chase," Book 1, the first of two novels by Cynthia R. White, eight years old, written on her own at home.

"As adults we seem to lose this habit of naïve perception. We disregard the trees, flowers, plants, sounds, odors all about us. We do not hear the train whistle, the song of the bird or the cricket. *Knowing about* takes the place of *knowing*. The child, however, seems to have a oneness with his environment, a kind of primitive communication with Nature, a love of Nature which enables him 'to hold communion with her visible forms.' "

A group of forty-one teachers, interested in Vernon's experiment, decided to repeat and add to it. They asked their pupils in Grades 3 through 8 to write a list as in the original study. In the kindergarten and the first two grades, the teachers asked the children to give their answers in individual conferences. The next day in Grades 3 through 8 pupils were asked to select one thing they had listed the day earlier and explain why they believed as they did.

The responses of the more than six hundred children were most revealing. A detailed analysis has not yet been completed, but already certain patterns are emerging. Among the loveliest things most often mentioned were dogs, flowers, babies, houses, sunsets, rainbows, the American flag, water, butterflies, and snow.

One item appeared a surprising number of times. At least the investigators were unprepared for it. The item? Money. Are the children telling us something about our culture? The item turned up on the lists as: money, a full bankbook, gold, a million dollars, bonuses, and "my bank." In the middle and upper grades many children mentioned jewelry, new automobiles, modern homes, furniture, clothes, backyard swimming pools, and boats.

Some of the individual responses were striking. The number after each item in the following list shows the child's grade:

FROM GIRLS	FROM BOYS
Cardinals against the snow (7)	Singing (4)
Lily pods on a river bed (6)	A fire in a fireplace (7)
Plants beginning to grow (3)	The things I create with my own hands (8)
	The velvety look of my front lawn after I cut it (8)

On the second day of the experiment a boy in seventh grade turned in this paragraph:

> The lovliest thing I know is to see a train rumble down steel rails and big engines pull long trains. I like to see powerful drivers of the steam engins and big powerful diesels go zooming passed a way station. I also like to see little switchers hustle about a yard moving cars to different places to make up trains. Also I like to see a train go thundering around a mountain and across bridges.

Does this writer know his subject? He misspelled "engine." But look at the words he could spell. Notice how well the words he has used suggest the power and sound of trains. This was a first draft with no special opportunity for revision.

The experiment gave the teachers an opportunity to see how their pupils could write in class when the subject was broad enough to appeal to everyone. The writing assignment itself was short enough that pupils were able to complete it with satisfaction. Teachers among my readers might care to try the plan in their classrooms.

By now the reader must be aware of the plea I am making—a plea for teaching, not just talking about, proofreading. The real test of effective handling of the mechanics of written expression is not in the pupil's response on a standardized test, but in his use of mechanics in his own work.

Even in tests, it seems to make a difference whether the material is presented in type or in cursive writing. In seventh grade a few years ago I made two pilot studies, one in spelling and one in punctuation. The results seemed to show that pupils were able to locate errors in spelling and punctuation more easily in typed material than in longhand copy. This finding needs to be explored further. If it is substantiated, it would suggest that practice material might be more effective if it looks like the child's own paper, which he is expected to proofread.

Proofreading should be taught systematically and sequentially. Textbooks and courses of study in the language arts give lip service to the idea, but how many of them give enough concrete, step-by-step help to the classroom teacher who is used to saying, "Proofread your papers before you turn them in"?

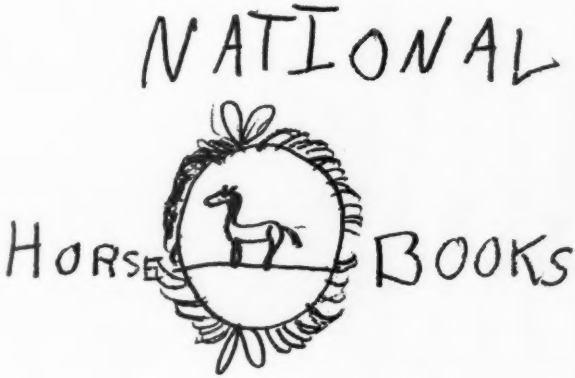
The habit should be encouraged early. Often college students even at the graduate level fail to proofread. A careful plan needs to be worked out to suggest what should be done in each grade to develop the child's skill in proofreading.

Even first-graders can make a beginning. The first time they write their names they can check the spelling and the formation of their letters against the teacher's copy. The first time they send notes or invitations that they copy from the chalkboard they can check capitalization and end-of-sentence punctuation.

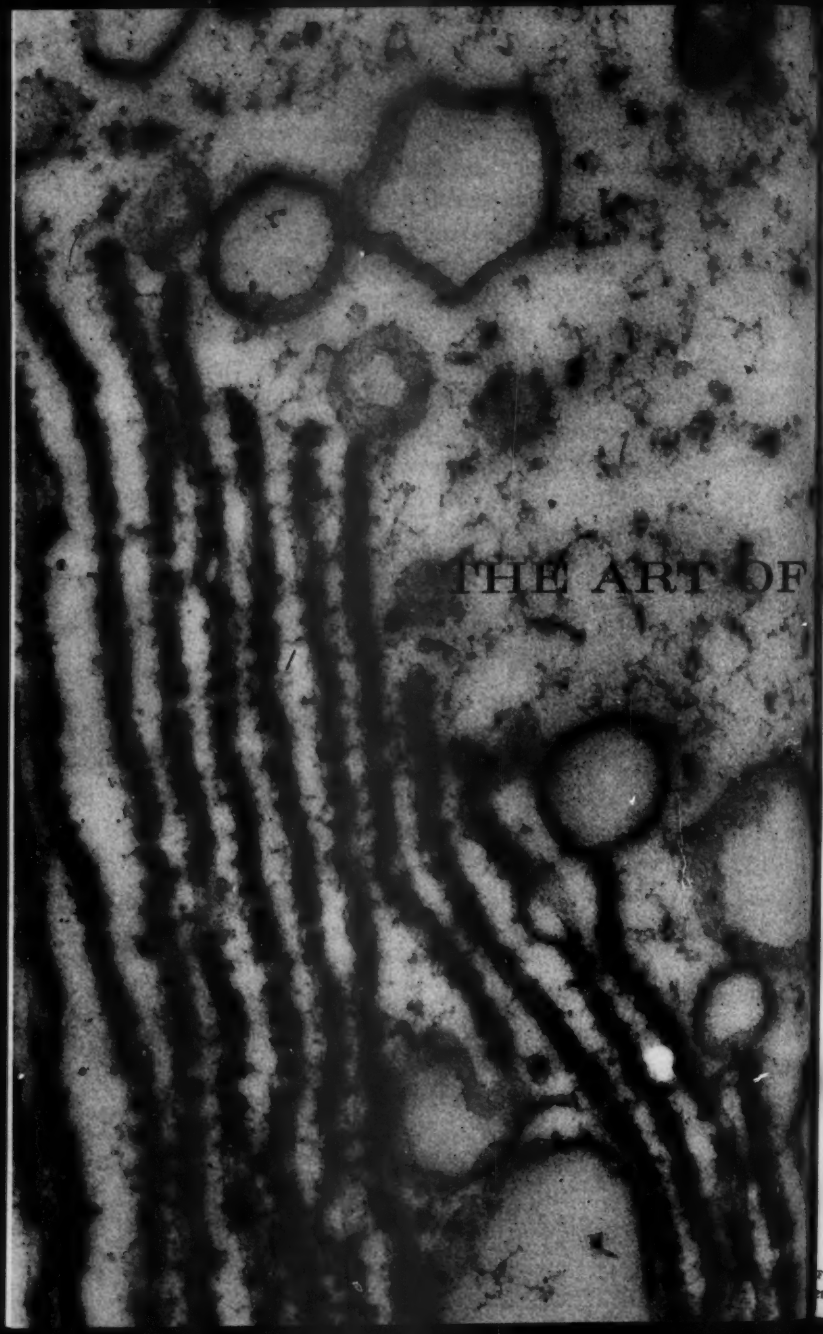
Often pupils can do a better job of proofreading a selection a day or so after they have written it than they can immediately after the writing. Only a few items should be checked at a time. Even in high school, students can seldom proofread their papers for all kinds of errors at one sitting.

Can children develop writing competence in the elementary school? Most children can. If we want to encourage good

writing, we should separate content from mechanics of expression. If we must give marks, we should give at least two marks, one for content and one for mechanics. We should give writing assignments that are brief and thought-provoking, and we should give them often. We should encourage children to use their five senses so that they become increasingly aware of the world about them. We should encourage the young writer to use the best and most effective words he knows, words that will build the picture or the mood he is trying to create. We should avoid overwhelming the writer with his errors. We should teach him to proofread systematically.



Colophon by the author-publisher, from two novels by Cynthia R. White


THE ART OF

low much of a scientist's work involves

LOGICAL REASONING?
PATIENT OBSERVATION?
ACCIDENTAL DISCOVERY?

By A. S. PARKES

SCIENTIFIC DISCOVERY

Some years ago, at a research institute in London, a group of philosophically minded members of the staff decided to hold a series of discussions on the aims of science. After a while they ran short of themes, and a colleague suggested that they should turn their attention to the question, "Is it better to work or talk about it?" This remark stuck in my mind, because I have always felt that it is better to work than to talk. In particular, for me, the fascination of scientific work has been enough, and I have been more than content to leave discussion of the philosophical and social background of science to others. Nevertheless, it is difficult to work year after year in an active laboratory without having some thoughts about the scientist, especially as to how he obtains his useful, interesting, or even embarrassing results. It is these thoughts, supplemented by some highly eclectic reading, that I set before you now.

RT: Electron micrograph of the oöcyte of a snail, taken by
ewson H. Swift, Professor of Zoölogy, University of Chicago.

To start with, I must make two things clear. First, I have no formula for making discoveries, and I hope no one expects that I have. If I had such a formula, I should have used it myself long ago. The most anyone can do is to conduct a careful post mortem on how discoveries have been made in the past, in the hope that the results will assist prognosis in the future.

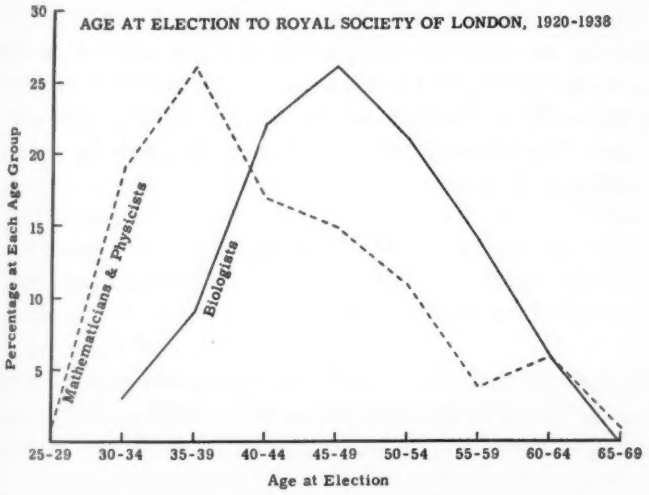
Second, I must limit the scope of my subject. In taking the art of scientific discovery as my text, I am thinking mainly of those who extend the frontiers of knowledge rather than of those who fill in the details. But particularly I am thinking of the biologist, in the widest meaning of the word. The medical man, for instance, is a biologist in the sense that he deals with material which is living—at least to start with.

THE BIOLOGIST COMPARED WITH THE MATHEMATICIAN AND PHYSICIST

The distinctions among the various branches of science are important ones. The solution of various problems requires the use of reasoning, knowledge, inspiration, and experience in very different degrees. The same is true of different branches of research. In general, it may be said that the mathematical and physical sciences, on the one hand, and the biological sciences, on the other, call for very different qualities in their exponents. The physical sciences are more dependent on reasoning and calculation, the biological ones on knowledge and experience; and the inspiration required by both is correspondingly derived. This difference has some interesting results. It means that the physicist is likely to mature before the biologist, and this tendency is reinforced by the fact that inborn ability of the kind applicable to the physical sciences flowers earlier than that applicable to the biological sciences. Newton had firmly laid the foundations of his immortal work by the

time he was twenty-four years old. Charles Darwin, by contrast, had some inkling of the theme of the *Origin of Species* when he returned from the "Beagle" voyage at the age of twenty-seven, but he continued to collect material and develop his ideas for another twenty years before beginning to put them on paper.

It is a well-known fact that the average age of election to the Royal Society of London varies greatly according to the two main divisions of the sciences. A. V. Hill's survey of the age of candidates at election between the wars is shown graphically in the graph below. This shows that the peak age of election for



mathematicians and physicists corresponds to a working life of little more than half that required by the biologists. This fact could obviously have various explanations, but it seems safe to attribute it mainly to the later maturation of the biologist. The fact is of some interest to directors of large research establishments because it means that they can continue to hope for

something from their biologists long after they have despaired of their mathematicians and physicists.

This difference among adult scientists can be extrapolated backward to the infant prodigy. Most biological oddities of this kind are calculators or memorizers, and, among the innumerable records of the feats of such people, I like especially the recent one of the seventeen-year-old adolescent with the mental age of a babe of two who, among other accomplishments, extracted the seventh root of 24,137,585 in 25 seconds. From the present point of view, the important thing is that infant prodigies, whatever else they may be, are never biologically inclined.

Having dismissed, in this cavalier fashion, all other kinds of scientist, we must now consider the biologist and the mental characteristics required by his work. To give definition to some of the words involved, let us consider some paper problems.

Take the following addition problem, in which figures are represented by letters:

$$\begin{array}{r} DONALD \\ GERALD \\ \hline ROBERT \end{array}$$

We are told that $D = 5$, and this information enables us to find the values of the other letters by a process of simple reasoning.[1] Guesswork or trial-and-error methods are not in-

1. We are told that $D = 5$;
Therefore, from col. 6, $T = 0$;
Cols. 1 and 5, R = an odd number greater than 5,
Col. 2, $E = 9$, $\therefore R = 7$;
1, $G = 1$,
5, $L = 8$,
4, $A = 4$,
and from Col. 3, $N = 6$, $B = 3$, $\therefore O = 2$.

volved, and the only *knowledge* required is of the most elementary arithmetic. Experience of the type of problem is of some help but is not essential. Inspiration is not much help. This particular problem was discussed by F. Bartlett in his Croonian Lecture to the Royal Society in 1956 and was cited by him as typical of problems which contain all the necessary data within themselves and which can be solved by anyone with sufficient powers of thinking to deduce the data one by one. Needless to say, this type of problem does not exist in biological research.

Now take a problem of a very different kind. Consider the letters

O T T F F . .

These form an intelligible series, and the problem is to add two more in the same series. The scientist drawing on experience and knowledge would probably approach the question mathematically, work out the alphabetical interval between the letters, and try to continue the series in that way. It is difficult to imagine what result he would get. The real key to the problem is somewhat different, for the next two letters in the series are *S S.*

One Two Three Four Five Six Seven

This problem is said to have been set in an examination for eleven-year-olds and might well be solved by a child, unhampered by excessive knowledge and with the spelling of the simple numerals well to the front of his mind. This example holds a lesson for the scientist; he should make sure that a problem is not ridiculously simple before attacking it with massed intellectual artillery.

The two problems so far mentioned are similar in depending for their solution on only the most elementary knowledge, but the first one requires a well-developed faculty for thinking, while the second yields only to sudden inspiration.

A problem of a quite different kind is presented by the familiar anagram, in which a word has to be reconstructed from its letters given at random. Here reasoning is useless for words of more than one syllable, because the number of letters involved could be arranged in a vast number of combinations. What is required is an adequate vocabulary—that is, knowledge—and a flair for spotting the likely syllables. The anagram has something in common with problems in biological research, but the best analogy is probably provided by the more erudite type of crossword puzzle. Their solution may involve a very wide range of knowledge and a flair for spotting the hidden meaning of a clue; some power of reasoning is also involved, and experience of the kind of problem is useful. All paper problems of the kind mentioned above, however, are essentially self-contained and complete and in that way differ fundamentally from problems in research, which are interdependent and usually short of essential clues.

ART OR SCIENCE?

What, then, are the mental qualities required for biological and medical research? Here we have a substantial literature to guide us. I would recommend you particularly to the writings of Wilfred Trotter, especially to his delightful essay, "Has the Intellect a Function?" [*The Collected Papers of Wilfred Trotter, F.R.S.* (London: Oxford University Press, 1946).] Trotter maintained that, to perceptive minds, chance and intuition are

weapons far more potent than reason and logic, and few will disagree with him. Even worse, what passes as reasoning has usually been invoked to maintain traditional views and oppose new discoveries and, used alone, has done more harm than good in science. How often are we tempted to say, basing our views on accumulated knowledge, "it stands to reason" that so-and-so's ideas are unsound or that his results cannot be right. Thirty years ago it was known that estrogen would terminate pregnancy in experimental animals, and it "stood to reason," therefore, that the placenta would not actively produce it. Yet it does. Most discoveries could not have been deduced from existing knowledge and could not, therefore, have been arrived at by processes of reason alone. In biology we never have all the relevant facts available, and there are nearly always alternative explanations of those we do have. As a result, the development of a discovery can be planned, but the original discovery cannot. It is true, of course, that to reach the ranks of the immortals, a scientist must combine exceptional inspiration with the most powerful intellectual machinery, but the fact remains that most scientists who become prominent do so mainly by virtue of other characteristics than a capacity for reasoning. The significant implication follows that a distinguished scientist may be as irrational as anyone else, or even more so. This theme is fully developed in a book by W. I. B. Beveridge which he called *The Art of Scientific Investigation*, from which I have adapted the title of this lecture.

In taking the art of scientific discovery as my theme, I want to examine the idea that creative research is essentially an art; I want to talk about the way discovery happens rather than about the technology of investigation.

Let us first consider some of the unexpected things that can happen from following up an idea.

It has often been pointed out that a very good example of the use of hypothesis is provided by Columbus' discovery of America; it has many of the features of a classic discovery in science. Columbus, you will recall, was obsessed with the idea that if the earth were round he could reach the East Indies by sailing west. Notice the following points: (*a*) the idea was by no means original, but he had obtained some additional scraps of information; (*b*) he met great difficulties in getting someone to provide the money as well as in making the actual experiment; (*c*) he did not find the expected new route but, instead, found a new half of the world; (*d*) despite all evidence to the contrary, he clung to the belief that he had found a new route to the Orient; (*e*) he got little credit or reward during his lifetime; (*f*) evidence has since been brought forward to show that he was by no means the first European to reach America.

Many discoveries in science have been made in a similar way by acting on a hypothesis, though, as in the case of Columbus' voyage, the discovery may be quite different from what had been expected, even if the basic idea is subsequently proved to have been correct. An incorrect hypothesis also may be fruitful, though it may then be very misleading. In particular, the so-called "working hypothesis" is a dangerous tool. In biology, an observation may have half-a-dozen explanations, but fitting it to a preconceived hypothesis will exclude all explanations except one and give the observer five chances out of six of being wrong. This abuse of the working hypothesis is merely another form of the elementary logical fallacy that if chalk is white then everything that's white is chalk. Admittedly, it would be difficult to carry out an experiment without any pre-existing ideas, but it is unsafe to say, "If my hypothesis

is correct, such-and-such will happen when I do so-and-so," because such-and-such may very well happen even though the hypothesis is incorrect. It is much safer to say, "Let us see what happens when we do so-and-so," and then consider possible implications of the result. With this in mind, Claude Bernard insisted that, although hypothesis is essential in the planning of an experiment, once the experiment is commenced, the observer should forget his hypothesis. Probably the most difficult thing in scientific life is, in Bartlett's words, "to be loyal to the evidence"; or, as A. Burton has said, "to show in the true essence of science a dispassionate willingness to examine anything on the basis of the evidence, and allow the ultimate supremacy of the facts over even the most cherished preconceived views."

It may be appropriate to recall on this occasion the origin of the pellet-implantation technique which has proved of some value in endocrinology, partly because it illustrates the development of an idea and partly because the first clinical application was made by Dr. Peter Bishop. In the early days of the crystalline androgens, we had good evidence that testosterone was more effective if its absorption was slowed up. We were therefore surprised to find that it was highly effective when dissolved in propylene glycol, which is miscible in water and rapidly absorbed. To explain this inconsistency, Dr. R. K. Callow suggested that the solvent was being diluted by tissue fluids before absorption and that the dissolved hormone would then come out of solution and in the solid form take a long time to be absorbed. From this idea it was a quick step to the implantation of solid material, and in a first experiment 2 mg. of estrone implanted as a solid crystal were found to be effective twenty times as long as the same amount injected in oil solution. This gratifying result was compatible with Dr. Callow's idea but did not prove that it was correct. We still do not

know, but, correct or incorrect, the idea was certainly fruitful.

I want now to consider the role of chance in discovery.

THE ROLE OF CHANCE

It is well known to laboratory workers that chance and accident have been responsible for many major and a multitude of minor discoveries. This may happen in various ways. A well-conducted experiment, designed to elucidate one problem, may, in the result, throw brilliant light on another; or some odd circumstance may intervene to alter the whole bearing of the experiment; or, again, the experimenter may make a simple mistake and in doing so make a discovery. Even negligence has a place in the fount of knowledge.

Sir Henry Dale in his lecture "Accident and Opportunism in Medical Research" emphasized the importance of the unexpected result, which, as in the case of Gowland Hopkins' discovery of accessory food factors, has sometimes given birth to a new branch of science. Discoveries arising even more directly from chance—that is, from accident or negligence—have been catalogued by many writers, and many well-known examples could be cited. The value of adding calcium and potassium to physiological media was discovered because Sidney Ringer's laboratory attendant became bored with preparing distilled water and used tap water for making physiological saline. Hans Gram hit upon his method of staining bacteria because he took the wrong bottle from a shelf. Acid-fast staining of tubercle bacilli arose from the accident that someone lit the stove on which someone else had casually placed some preparations, and so on.

So far as my own experience is concerned, two fruitful observations have been made in this sort of way.

Many years ago, when I was very inexperienced, I used fe-

male mice when I thought I was using male mice and that, of course, led to most interesting results. The experiment in question related to sterilization of the gonads by X-irradiation and led, not as expected, to some routine observations on the testis, but to the interesting discovery that cyclic endocrine activity on the part of the ovary might persist for a time after the obliteration of its cyclic structures.

More recently, the power of glycerol to protect many living cells against the otherwise fatal effects of freezing and thawing was discovered in my laboratory because my colleagues, Drs. Audrey Smith and C. Polge, added Meyer's egg albumen instead of levulose solution to the medium in which fowl sperm were suspended, the bottles having been mixed up in the cold storage.

Probably the most famous of all examples of discoveries arising by chance is the discovery of the antibacterial properties of the mold *Penicillium*, and this example serves well to point a moral. The accidental contamination of Alexander Fleming's bacterial cultures by spores, which led ultimately to the discovery of penicillin, would probably not have happened at the present time when sterile rooms and filtered air would be the rule for such work. This raises a somewhat paradoxical point. In the past, chance has been a fruitful source of discovery; but present-day planning of research is designed, so far as possible, to eliminate chance by abolishing the wayward experiment, the odd circumstance, and the chance mistake. We should perhaps remember that in perfecting the science of investigation we may starve the art of discovery. Chance, however, does not always come to our assistance, as is well shown by the history of another group of antibacterial compounds. Sulfanilamide was known to chemists more than forty years ago, but its bacteriostatic power was unknown until shortly before World War II, when it was discovered as a long-term result of an erroneous

hypothesis. It is salutary to consider that the course of history might have been altered had the biological properties of sulfanilamide been discovered by chance or otherwise before the first war.

I must be very careful not to give the wrong impression in these remarks about chance. I do not want to imply that anyone can work in a laboratory for a few weeks, make a lot of stupid mistakes, and thereby make discoveries. What I am trying to say is that if, working hard enough and long enough with sufficient single-mindedness, one makes some small discovery, then, looking back, it will probably appear that chance played a large part in it. At best, chance does not make discoveries unaided. Odd things happen almost every day in an active laboratory and may make little, if any, impression on the observer; those that do attract attention are often discounted as irrelevant nuisances, which is exactly what most of them are. To quote from Beveridge:

> Anyone with alertness of mind will encounter during the course of an investigation numerous interesting side issues that might be pursued. It is a physical impossibility to follow up all of these. The majority are not worth following, a few will reward investigation, and the occasional one provides the opportunity of a lifetime. How to distinguish the promising clue is the very essence of the art of research.

INSPIRATION

Beveridge's remark is very true. Inspiration has many roots: it must be based on adequate knowledge, and often it involves visualizing a connection between apparently unrelated facts; but mostly it requires that elusive something—the ability to divine the significant happening and to appreciate its possibilities that distinguishes the great scientist. This elusive some-

thing defies analysis, as does the genius of the great painter or composer. It is compounded of imagination, intuition, insight, flair, or what you will, and, as Appleton has pointed out, it is for the most part an individual, personal matter. But there are exceptions. Two minds may strike from each other sparks which neither would have generated separately. Not infrequently, two pieces of knowledge and two different outlooks, coming from different minds, fit together like pieces of a jigsaw puzzle and provide the answer or the clue to a long-standing problem. In my own experience, sudden contact with a pharmacologist who knew about decerebrating animals, whereas I knew about the anterior pituitary body, enabled the acute effects of removing the gland in rabbits to be studied long before surgical techniques for carrying out hypophysectomy in that species were evolved. Such potentiation of one mind and one discipline by another is the crowning glory of the university and the justification for the association of research facilities with university departments or their aggregation into large institutions.

But, essentially, inspiration is a matter of individual enterprise. My one-time tutor, Dr. F. H. A. Marshall, who had no collaborators of note in his most inspired days, influenced the development of the physiology of reproduction to an extent out of all proportion to the volume of his scientific writings. When he died, a few years ago, his obituary notice included this paragraph:

> Scientists are of many kinds, but inspiration flows most fruitfully from those who are able, by some gift withheld from lesser men, to divine the richness of uncharted country and sense the vital landmarks. Thus do they avoid the barren places and the morasses of unimportant detail which engulf so many. To these, discovery is an art rather than a science, a matter of instinct rather than of intellectual machinery.

This concept of the great scientist as a creative artist has important implications. How can imagination, intuition, originality, and the like be encouraged, and what factors are likely to be inhibitory? Beveridge points out that intuition, originating in the subconscious mind, will come to the surface only when the conscious mind is relaxed and receptive and will do so, in fact, most readily on the fringes of consciousness. There is at least one authentic record of a biologist passing on a deathbed inspiration to his favorite pupil, who was able, by a few simple experiments, to demonstrate the correctness of the idea and thereby to make a substantial contribution to knowledge. Most of us, however, would prefer not to go to our deathbeds to obtain inspiration, and fortunately there are other methods. For instance, Descartes is said to have developed his ideas while lying in bed in the morning; Brindley, the engineer who built many of the English canals, when up against a difficult problem, would go to bed for several days until it was solved. Other recipes for encouraging intuition include light occupation, pottering in the garden, sitting in the bath, and the like. All this boils down to the idea that a scientist must have time and opportunity for meditation and must not be expected to spend all his life in an intellectual steeplechase. Speaking of Isaac Newton's years at Woolsthorpe Manor, E. N. da C. Andrade says: "Leisure and quiet do not produce a Newton, but without them even a Newton is unlikely to bring to ripeness the fruits of his genius."

And here we meet a difficulty. During the last fifty years scientific research has changed from a vocation to a highly organized profession—a learned profession it is true, but still a profession which offers financial ease and public honors to its more successful exponents and a pleasant and comparatively carefree existence to the rest. This change has brought an enormous improvement in the status of the scientist, but in some

ways the change has been for the worse. Security is not always a stimulus, and the atmosphere of a busy profession is not conducive to the meditation and personal practice which earlier were characteristic of the scientific life. On the contrary, the scientist, who used to be able to pursue his work in the peaceful academic atmosphere which was the foundation of his discoveries, now lives in a whirl of meetings, memoranda, and administration which makes it difficult for him to give consecutive thought to anything.

Fortunately, there is another side to this picture, because of the undoubted fact that scientific insight of the highest order may go hand in hand with all sorts of unlikely characteristics, including, rarely, continuous mental and physical activity. As Derrick has said, "The advent of a genius is unpredictable. He cannot be organised into any scheme, for he creates his own world. All that planning can achieve in regard to genius is to provide . . . an atmosphere . . . in which he can flourish, and to pray for the grace to recognise and encourage him." This, of course, is not so easy as it sounds for many reasons. In the Western world we are fortunate in being free from the worst enemy of expanding knowledge, authoritarianism, with which seekers after new knowledge have often had to fight. Nevertheless, it is in human nature to be allergic to new ideas, and discoveries are rarely received with undiluted enthusiasm. This is particularly true when the discovery impinges upon some vested interest or conflicts with the views of a scientific hierarchy. Many years ago T. H. Huxley pointed out that it is the common fate of knowledge to start as heresy and end as a superstition, and recognition that the end of this cycle has been reached is usually belated. Countless examples of opposition to new knowledge could be cited. Last year saw the centenary of the birth of Ronald Ross, whose discovery of the malaria parasite in the mosquito has had a decisive influence

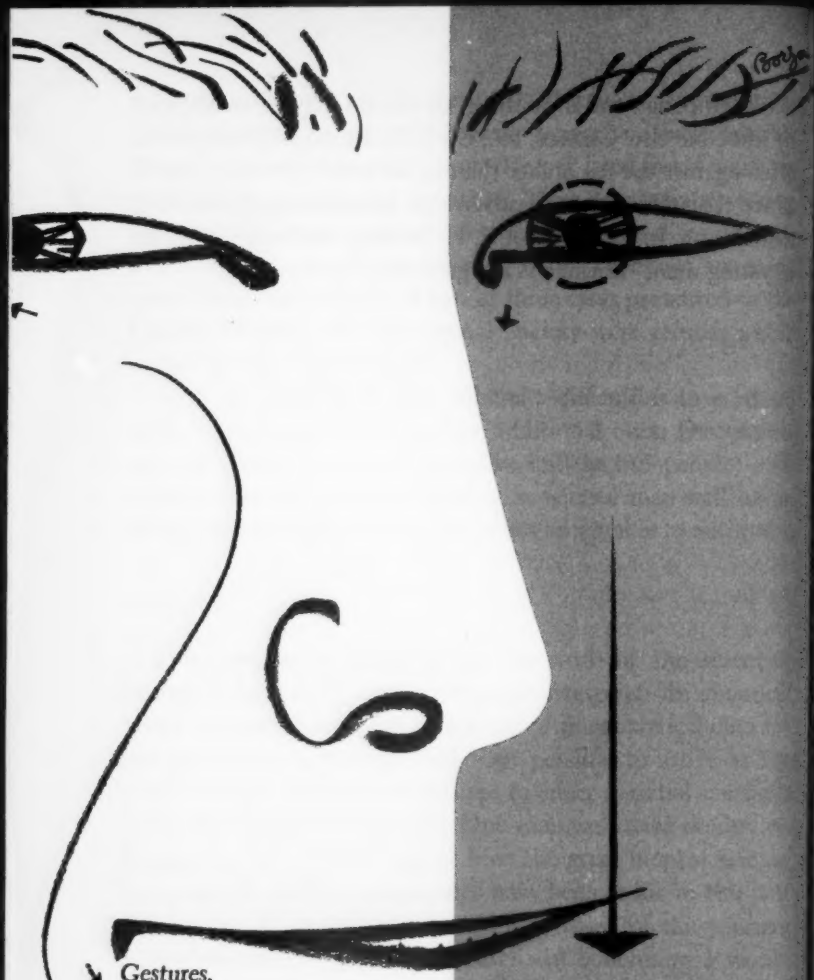
on human history. Yet, in the words of a recent appreciation, "at the time of his original discovery he received every possible discouragement from officialdom. He persisted in his work because he was a dedicated scientist." More appropriately today, we may recall that Addison's description of the disease which now bears his name was received with skepticism in many quarters and that reports of two or three cases presented to the London Medical and Chirurgical Society were refused publication in the *Transactions*.

In short, discoverers have inherent difficulties to contend with. They themselves may raise additional ones. Discoverers are not always the most persuasive and tactful people, and, moreover, an independent thinker in science may well be an independent thinker in other ways less acceptable to authority.

EPILOGUE

These are some thoughts on the work of the scientist, prompted by a fairly long experience of research. In chemical terms it seems that we can give many of the analytical data for the great man of science. Is it then possible to arrive at the constitutional formula and perhaps to effect a partial synthesis from more plentiful material? One may well have doubts on this point, but a knowledge of how the great men of science have worked and how discoveries have been made in the past can hardly fail to help those, especially those of the younger generation, now engaged in research. In conclusion I would say this: A man engaged in creative science is often regarded as doing a desirable and rewarding job under pleasant conditions. This is undoubtedly true, but it is only half the picture. Research is compounded of work, hope, doubt, bafflement, and more work, and, at the end of it all, disappointment is far more common than even minor triumph. Years of work along a par-

ticular line may end in nothing, or success may be anticipated by someone else. Chance, too, is a fickle friend and works more often against the researcher than in his favor. Yet every day of active research work is an adventure, exasperating, fascinating, stimulating. In the words of E. H. Starling, that inspired leader of young men, "research is the greatest game on earth."



Gestures,

Facial Expressions,

how and when

you conduct an interview—

what do they say

that your voice leaves unsaid?

The U

Communication covers a broader terrain than most of us realize. Since language is one of man's most distinctive characteristics, we sometimes slip into the error of thinking that all communication must be verbal. Executives and administrators —whether in education, industry, or government—are especially prone to this fallacy. This, of course, is not surprising, for the executive's world is largely a verbal one.

To persist in this narrow view of communication is folly. Yet few training programs for executives escape such folly; most of them ignore the entire range of non-verbal communication, the muted language in which human beings speak to one another more eloquently than with words. To avoid the narrow view, we must start by recognizing that man communicates to his fellow man with his entire body and with all his behavior.

Muted language often reinforces the messages we receive from others through verbal communication. But we sometimes find ourselves in situations where we seem to be receiving contradictory messages from the same person. His words say one thing, but through some strange intuition we feel that his behavior says just the opposite. Under such circumstances which message are we to believe?

Consider a few examples. You meet John Anderson for the first time in his office by appointment. You arrive on time; his secretary says that he is busy but will see you in a few minutes.

Unvoiced Message

By Andrew W. Halpin

He is alone in his office, and, as you wait in the outer office, you note that no lights are glowing on the receptionist's switchboard. Anderson is not on the phone. Yet you wait fifteen minutes until he buzzes his secretary to have her usher you into his office.

He is seated behind a large mahogany desk and across the desk, directly opposite him, is a visitor's chair. He reaches across the desk to shake hands with you, declares that he is happy to meet you, and asks, "What can I do for you, Mr. X?" In shaking your hand, his handclasp is firm enough, but you feel that his forearm is locked at the elbow. At the same time that he is saying how pleased he is to meet you his hand and his arm are almost pushing you away from him and subtly reminding you that he wants you to keep your distance. This maneuver is emphasized by the obvious status symbol: the impressive mahogany desk. He uses this symbol physically as a barrier which he keeps interposed between you and himself.

You begin to realize more fully the significance of the fifteen-minute wait in the outer office. You recall that, instead of coming to the door himself, he buzzed his secretary to bring you in. The omission of any apology for keeping you waiting fits the rest of the picture.

Here is a man infatuated by the sense of his own importance, a man who insists on keeping status lines clear and sees to it that you know your place. His voice is hearty, he says all the proper things, he assures you of his co-operation. Yet at least twice during your short conversation he interrupts you before you have finished your sentence. During your twenty-minute visit his phone rings three times. He excuses himself on each occasion with a deprecatory gesture, as if trying to say, "You know how these things are." But, because his expression shows no concern for you, the intended apology in his gesture does not come through. What comes through instead is a

different message: "See what a busy, important man I am. You should be grateful to me for even seeing you, for letting you nibble at the crumbs of my time which I'm throwing to you."

When your conversation is finished, Anderson stands—but still behind his barricade—smiles at you, perhaps a bit too unctuously, and tells you, "Feel free to drop in any time at all. I'm always glad to help the cause of education." You notice his stealthy glance at his watch and the slight tightening of the corners of his mouth. These barely detectable movements betray his impatience and fear lest you commit the blunder of prolonging the interview after he has decided to terminate it.

What good are this man's words, if his behavior violates everything he says? This example may seem slightly exaggerated, but is it really? Or does it seem exaggerated only because it is too close for comfort? We have all found ourselves in similar situations. But sometimes the cues from the muted language of others are so subtle that we do not immediately catch the discrepancy between what they say and what their behavior tells us they believe.

The contradiction between open language and muted language comes about because human beings are just as adept in using words to hide meaning as in using them to explicate meaning. The problem is confounded by the ironic fact that the man who uses words for obfuscation is frequently trapped in the net of his own deception, so that he himself no longer knows what he actually feels or believes. How much more honest are puppies: they wag their tails only at the people they like.

One of the keenest observers of the discrepancy between words and behavior was the distinguished French littérateur, André Gide. In a devastating remark about an associate, Gide

once said, "He talks about himself with great modesty, but constantly." Oblique to Gide's thrust, but equally incisive, is Albert Einstein's appraisal of a mediocre colleague, "He has no right to be so humble; he is not great enough."

Sometimes the words we say are spoken only as an empty ritual. For example, in education we have been urged to follow the principles of democratic administration, whatever this contradictory slice of jargon may mean. Consequently, many school administrators have learned the vocabulary of democracy and have practiced the techniques of human relations. But the man who uses these words and techniques and has no respect or heart for others is a fraud. Such men talk one game and play another and then seem grieved because the teachers on their staff suspect their motives.

Typical "human relations" training programs, especially those which emphasize techniques at the expense of theory, do little to narrow the gap between verbal and muted language.

An executive's use of time is a central feature in the muted language with which he speaks to others. In America we have strict attitudes about time: time is valuable and should not be wasted. We ascribe a tangibility to time and consider it a commodity that can be measured, bought, sold, saved, spent, wasted, lost, and made up. This attitude contrasts to attitudes toward time encountered, for example, in Latin America or in Arabia. The American executive seems especially enslaved by his attitudes toward time, so much so that the amount of time he allots to a subordinate and the point in the day when the time is allotted tells the subordinate—in muted language, of course—something about his status and the urgency, to his superior, of the issue under consideration. Thus a ten-minute appointment has a significance different from a thirty-minute appointment. The appointment a principal makes with a

teacher for 3:30 in the afternoon, immediately after classes have been dismissed, connotes greater consideration than one set for 4:30, which tells the teacher that she can keep herself busy until the principal can get around to her. To set an appointment ten minutes before the end of a teacher's free period is different from saying, "Let's have lunch together and talk it over."

When a meeting is scheduled, who waits for whom and for how long says important things about relationships. Most organizations or cultures develop informal tolerance ranges for lateness; to keep a person waiting beyond the tolerance limit is a subtle way of insulting him. However, the handling of promptness and lateness can vary with the subculture and with the functions of the meeting. Thus military officers are likely to arrive a few minutes ahead of the appointed time, whereas professors usually arrive from five to ten minutes after the set time. In the social sphere only a yokel arrives at a cocktail party at the stipulated time, whereas good manners require a guest to arrive at a dinner party not more than ten minutes late.

An executive's use of space also communicates his attitudes toward others. At a conference table does he invariably seat himself at what is clearly the head of the table? When he has two or more of his immediate associates with him in a conference with the members of a subordinate group in the organization, do he and his associates align themselves in formidable array on one side of the table, so that the physical arrangement itself emphasizes to the members of the subordinate group that they are supplicants before the judges of a high court? In a conference room where a table has been set, the chair farthest from the door is usually associated with highest status; the wise executive will avoid earmarking his

chair for his exclusive use. Where office space permits, a sensitive executive will keep a small table, with chairs, in addition to his desk; he meets visitors at this table, with the chairs arranged so as to diminish social distance.

If this discussion of tables seems picayune, please recall how much time of the opening sessions of the 1959 Geneva Conference was devoted to the seating of the East German delegates. The size of the table, whether it should be square or round, and where it should be placed in relation to the main conference table, all became explosive issues of protocol.

The executive communicates, too, by the distance at which he stands or sits when talking to associates. A neutral distance between persons for communicating information of nonpersonal matter is about four and a half to five feet. For personal matters, twenty to thirty inches is a neutral distance. In contrast, a range of five and a half to eight feet is a public distance; to keep a conferee at this distance is to discourage completely any discussion of personal matters. In short, the physical distance you set controls the content of the discussion.

How does the executive use space in setting the place of meeting? Does he invariably send for his subordinates and have them come to his office? Does he transmit all his messages through a secretary? Or does he often walk down the hall and stop in to talk with the associate in his office? Unfortunately, many an executive feels ill at ease with his associates the moment he leaves the protection of his own lair, for in his own office he is better able to control the time, course, and content of the conversation.

Status differences are inevitable; an organization cannot operate without them, for the moment you appoint a superintendent or a principal you assign him a status different from that of the teachers. We do not propose to abolish status differences. Nor do we believe, as Vance Packard advocates in

his recent best seller *The Status Seekers*, that status differences betray the American Dream. We merely suggest that an executive can secure better personnel relations by not brandishing status symbols. Communication has a greater chance of being effective when it takes place in a permissive, give-and-take atmosphere; such permissiveness is destroyed by a preoccupation with differences in status and authority.

Information can be exchanged best in a group where the leader himself tolerates some ambiguity and makes his proposals with an attitude of tentativeness. But an executive who is jealous of his authority and is personally insecure in his job can seldom assume an attitude of tentativeness; his comments are likely to be stained with dogma, and his remarks are usually delivered pontifically. What these unfortunate executives fail to understand is that their attitudes are transmitted non-verbally to their listeners and that these very attitudes cause listeners to react unfavorably to the content of the communication.

For excellent discussions of non-verbal communication—or muted language, as we have called it here—two recent books provide stimulating reading. The first, *Non-verbal Communication*, is written by Jurgen Ruesch and Weldon Kees. The senior author is a psychiatrist; his writing partner, a poet. The second and more recent book is *The Silent Language*, by Edward T. Hall. Hall, an anthropologist, is president of Overseas Training and Research, Inc., a concern which trains and advises American corporations that have extensive foreign interests. The book by Reusch and Kees is rich with photographs which vividly illustrate many subtle facets of muted language. Hall states flatly that culture is communication and that we can best understand a culture by analyzing its modes of communication.

We have discussed ways in which muted language transmits messages in various face-to-face situations. How does what we

have to say apply to the formal messages which a superintendent distributes through newsletters, personal correspondence, staff memos, and mass media? The attitudes which staff members hold toward an executive are derived from person-to-person, face-to-face interactions either in individual conferences or in small-group meetings. The attitudes built up through these interactions operate as filters through which the recipient perceives all other verbal, and especially written, communications. If the non-verbal messages which a teacher reads in a superintendent's behavior cause her to mistrust him, there is little likelihood that a flood of written bulletins will induce her to change her opinion. In fact, under such circumstances, the more information he pours out, the more she is inclined to denounce his efforts as a smoke screen to hide other shenanigans. The attitudes that make or break an organization are forged in the crucible of day-to-day informal relations. If these attitudes are healthy, the use of formal communication and mass media can be constructive. If these attitudes are negative, this negative view extends to everything the administrator tries to do.

We have all had the experience of being so repelled by the tone of a letter that we have categorically rejected its intended content. Many executives belatedly discover that their writing style transmits a muted message which says more to the recipient than the actually intended message. The letters of some men have verve and reveal across a continent the warmth and spontaneity of their personality. The letters of other men are stiff, dogmatic, and insensitive to the feelings of the recipient. When we read a letter, the emotional tone comes through even faster than the substantive content.

The executive who is addicted to rules and regulations exposes his contempt for the human individual in letters which are bloated with bureaucratic jargon. Heavy reliance on the

third person, neuter, and persistent use of the passive voice reflect impersonality—"It has been decided that . . ." The repetition of stale clichés as substitutes for thought bespeaks either laziness or shallowness. Regrettably, few executives realize that a pompous style and poor manners in writing can create attitudes just as antagonistic as those aroused by poor manners in face-to-face meetings. In face-to-face relations even a boor—if he is perceptive enough—can catch some feedback from his listeners and modify his behavior before he has done irreparable damage. But, in a letter or a memo, a gauche remark is imprisoned in print and can haunt the writer for years.

Many letters or reports written by administrators can be described best not as muted language but, more pathetically, as mutilated language. Our schools and especially our colleges of education may be partially responsible for what Professor Henry Higgins, the hero in Shaw's *Pygmalion*, called "the cold-blooded murder of the English tongue." Books on education, and especially those on educational administration, ooze with verbal slush. After repeated exposure to this deadly fare, a reader is no longer able to distinguish between a slogan and an idea. To compound the felony, professors insist that the graduate student, in preparing a thesis or dissertation, follow a manual of style that perpetuates the use of the inert, passive voice. Fortunately, a few major universities are trying to get away from this practice. They are recognizing that the dogged use of the third person does not automatically produce the objectivity ascribed to it. Perhaps we should listen to the plea of W. Furness Thompson, vice-president in charge of research and development for Smith, Kline and French Laboratories. In his sparkling article, "Why Don't the Scientists Admit They're Human?" (*Saturday Review*, September 7, 1957), Thompson urges us to report scientific findings in a

lively fashion, to avoid the pretentiousness of a spurious objectivity.

Obviously, we cannot eliminate all technical language, for the language of science constitutes much of its substance. This language provides a highly desirable precision which is seldom matched by the language of everyday life. It should be noted, too, that, although literary style may enhance the enjoyment of a communication, literary critics are rarely competent to practice their art on legal or scientific documents. But if we cannot eliminate the essential jargon—and here we use the term not in the pejorative sense but to refer to the specialized vocabulary and idiom of those in the same profession—we can at least get rid of the gratuitous jargon. The difficulty is that gratuitous jargon proliferates so promiscuously; only by constant vigilance can we train ourselves to avoid the use of jargon for its own sake. The literary critic, Lionel Trilling (in his book *The Liberal Imagination*), has noted how easily technical language can degenerate into the language of non-thought:

> A specter haunts our culture—it is that people will eventually be unable to say, "They fell in love and married," let alone understand the language of *Romeo and Juliet*, but will as a matter of course say, "Their libidinal impulses being reciprocal, they activated their individual erotic drives and integrated them within the same frame of reference."
>
> Now this is not the language of abstract thought or of any kind of thought. But it is the language which is developing from the peculiar status which we in our culture have given to abstract thought. There can be no doubt whatever that it constitutes a threat to the emotions and thus to life itself.

When we stoop to this language of non-thought, we reveal our intellectual sterility. Trilling's example is extreme but not

far removed from the bafflegab perpetrated every day by some harassed executive.

Bureaucratic language is weasel language, constructed for men who want to pass the buck and evade personal responsibility; it is the language of the faceless "they." If you have a feeling of warmth toward other human beings, why suffocate it under a pile of bureaucratic cant? However, the bureaucratic style is ideally suited to three types of administrators. It is perfect for the fellow who is so mean that he would steal the straw from his mother's kennel. This fellow had best stick to jargon and use it as a cover for his meanness. Second, gobbledegook is a handy solution for the executive who has neither the time, the capacity, nor the predilection to think. Finally, bureaucratic prose is perfect for the faceless ones who have long since renounced any desire to develop their individuality. If you fall into any of these categories, by all means continue to write in a dull, impersonal, plodding style. But, if you still belong to the human race, please let your own humanness shine through your writing. . . .

No training programs have been conducted on the reading of muted language. No one is quite sure how to develop such a program. The task is a prodigious one, for it poses the blunt question, "How can we teach human beings to be more sensitive to the wide range of messages they are continuously receiving from their fellow humans?" Nor are we sure how much change in personality structure such an increased sensitivity may require. Training of this kind is more similar to a psychotherapeutic experience than to an orthodox teaching-learning situation. The task is formidable, yet those of us concerned with preparing better administrators cannot evade the responsibility for tackling this crucial job. Whatever suggestions we may offer here for dealing with this task are necessarily specu-

lative. Nevertheless, since speculation can furnish an impetus for action, let us examine three possible approaches for training administrators in the skills of reading muted language.

In pre-service and in-service learning situations, role-playing and sociodrama can make important contributions, provided that a trained observer is available to interpret cues. Training groups, supervised by specialists in group dynamics, can be extremely beneficial.

Furthermore, the "In-Basket Technique" now being used as a testing procedure for establishing criteria of "success" for elementary-school principals can be readily adapted as a training method to sensitize administrators to muted cues in written communications. This research study on elementary-school principals was directed by Daniel E. Griffiths at Teachers College, Columbia University. He adapted the "in-basket" technique, previously used by other investigators in both military and industrial settings, to the situation of the elementary-school principal. The principal is thoroughly briefed in his new role as Marion Smith, principal of the mythical Whitman School, in the Jefferson Public Schools, in the state of Lafayette. After the briefing, he is given a batch of notes, correspondence, and memos such as might be found in a principal's "in-basket." He acts as he sees fit on the items in the basket and later is asked to explain why he handled each item as he did.

An exploratory attempt to use the same materials for training purposes was made in an elementary-school principal's workshop conducted during the summer of 1959 at the University of Chicago. Luvern Cunningham, who had major responsibility for this workshop, reports that the "in-basket" materials are exceptionally useful for training purposes.

Thus far little has been done with kinescopes and recorded tapes for training in the observation of muted cues. There is

no reason why we could not film a variety of special administrative situations and have student viewers interpret what took place in the film. A competent discussion leader could then help the students achieve a richer understanding of how they themselves communicate with others. Another possibility would be to telecast through a closed-circuit television system scenes of actual administrators at work and have student observers analyze the administrator's handling of specific problems.

A second approach, which has been used principally in industry, is to have a trained consultant work directly with an administrator. The consultant acts as an observer, watching the administrator in his day-to-day behavior on the job. The consultant can then sensitize the administrator to relevant facets of his relations with others which he may be ignoring at his peril. This administrator-consultant relationship becomes an intimate one that must be maintained over an extended period of time. Obviously, the consultant must be skilled as a clinical psychologist and must be prepared to establish a counseling relationship with the client.

During this past year, four staff associates at the Midwest Administration Center of the University of Chicago have used a version of this observer technique; each of these four men observed a different superintendent in a variety of administrative situations during the school year. The associates did not report their observations to the superintendents but instead prepared verbatim reports of their observations and analyzed these reports in an advanced seminar conducted by two especially astute professors of educational administration. The associates concluded that this experience enabled them to detect muted cues which formerly would have escaped them entirely. These four men were Ph.D. candidates who had had extensive administrative experience in public schools. The can-

didates were chosen from a roster of highly qualified applicants drawn from the United States and Canada. Whether the success of the Chicago program can be duplicated with less able students is an empirical question that remains to be tested.

The third approach is both obvious and venerable: the use of a rich, liberal education, with major emphasis on literature. Whether a course is liberal or not is determined not by whether the course is given in a liberal arts college or a professional school but by whether the course as it is taught is, in fact, liberating. Some professional courses whose catalogue descriptions suggest that they are technical rather than liberal can prove very liberating indeed in the hands of a competent professor. Conversely, some literature courses, as they are now taught in liberal arts colleges, are deadly and certainly anything but liberating. The liberating quality of a course is established more by the professor than by the course content.

When we define our task as we have, in the form of a question, "How can we teach human beings to be more sensitive to the wide range of messages they are continuously receiving from their fellow humans?" what have we done but define one of the salient purposes of literature? The administrator is working with human beings, and his job puts him in a position of economic power over other human beings; it behooves him to understand the human heart, to understand—if you will—the ineffable ambiguity of the human condition. But this understanding is precisely what the poet, the playwright, the short-story writer, and the novelist seek to achieve. Through the eyes of these writers, we, as administrators, can freshen our insights into our own personal problems and the problems of those with whom we work. A competent novelist portrays his characters by what they do, not just by what they say, and in this shaping he explicates for us the myriad muted cues through which man communicates with man. The peren-

nial acrimony between colleges of education and liberal arts colleges has perhaps blinded us to the genuine and unique contribution which courses in literature can make to the preparation of better administrators.

Lest this suggestion be seen as the impractical proposal of an academician, let us note that the most dramatic, successful experiment along this line has been conducted by the Bell Telephone Company of Pennsylvania. This firm granted seventeen of its middle-level managers a ten months' leave of absence with full salary to attend a special institute at the University of Pennsylvania. There they received a far richer diet of liberal education than undergraduates majoring in literature receive in most universities. Significantly, one experience which these executives later reported as most useful to them in their jobs was the study of James Joyce's *Ulysses*. The company was delighted with the results of the experiment. Those who may be skeptical about this approach should also examine the small book, *Toward the Liberally Educated Executive*, sponsored by the Fund for Adult Education.

Literature can help an executive understand muted language; it can also give him a respect for language, and this will teach him how to communicate clearly. Listen to Peter Drucker, a professor of management at New York University and an industrial consultant to several large American corporations:

> It can be said with little exaggeration that of the common college courses being taught today the ones most nearly "vocational" as preparation for management are the writing of poetry and of short stories. For these two courses teach a man how to express himself, teach him words and their meaning and, above all, give him practice in writing. It can also be said that nothing would help so much to prepare young men for management as a revival of the honorable practice of the oral defense of one's "thesis"—only it should be

made a frequent, normal, continuing part of college work rather than something that happens once, at the end of formal schooling.

There is delicious irony in the fact that the hardheaded businessmen who direct America's great corporations are keenly aware of the special contribution that literature can make in the preparation of administrators, while professional educators—who presumably should be more cognizant of this contribution—have ignored it and have instead scurried after the Pied Piper of *scientific* "human relations" programs. The superintendent of a wealthy suburban school system will willingly pore over a sociological report on suburbia but ignore John Cheever's short stories. Which can give the superintendent better insight into the hearts of his clients: the sociologist's jaded statistics or Cheever's compassion? Cheever, indeed, has the edge.

Amusingly enough, many school administrators are loath to use this approach to a better understanding of muted language. They prefer a role-playing session or a conference to the chore of reading a decent book. A book by an able novelist demands attention. But many administrators have become so addicted to distraction in their day-to-day routine that, when no new distraction is imminent, they scan the horizon in search for one. Consequently, for these men the solitary, attentive act of reading a book is an unwelcome task. These men will travel a few hundred miles for a conference and absent themselves from their office several days for a meeting, and yet feel guilty about devoting a few hours a week to serious reading.

You will note that the three approaches we have suggested for "muted-language training" entail three levels of personal interaction. The first—which includes role-playing, training groups, group discussion of administrative behavior and instruction focused on the interpretation of muted cues—de-

mands that the learner become a member of a formal class or formal group. The second requires learning on a tutorial basis, from a consultant who maintains a direct relationship with the client. The third can be accomplished without the intervention of another person: this learning takes place solely between the learner and the author of the book. In respect to the degree of required interaction, there is an approach available to everyone. How fruitful any one of these three approaches will be remains to be seen. Quite possibly one approach may prove more suitable for some administrators, and another more successful with others. This whole area of training provides a new and a challenging opportunity for bold experiment.

CONQUEST OF UTOPIA

y Eric R. Wolf

hen the Spaniards came west to conquer the New World, they
nvisioned not one, but three different kinds of Utopia.
me hoped for gold, some for land, and others to save souls.
two brief years—1519–21—they changed the face of Middle
nerica—but for whom did the visions come true?

In 1492, Christopher Columbus, sailing under the flag of Castile, discovered the islands of the Caribbean and planted upon their shores the standard of his sovereigns and the cross of his Savior. From these islands, the newcomers began to probe the Middle American coast [now Mexico and Guatemala].

In Easter week, 1519, a young adventurer, Hernán Cortés—lawyer by professional training and military man through baptism of fire on Santo Domingo—landed in the vicinity of San Juan de Ulua in Veracruz. He brought with him an army of 508 soldiers—32 of whom were crossbowmen and carried harquebuses—16 horses, and 14 pieces of artillery, together with a navy of 11 ships and 100 sailors. In July and August of that year, Cortés beached his ships and embarked on the conquest of Tenochtitlán [the city built by the Mexica in 1344 or 1345]. Two years later, on August 13, 1521, Tenochtitlán fell into Spanish hands. One cycle of history had come to an end and another cycle began.

How is one to explain this sudden irreversible change in the fate of Middle America? The entire enterprise of the Spanish Conquest seems shrouded in a curious air of unreality. Hernán Cortés conquers an empire embracing millions of people. For lack of holy water, a Fray Pedro de Gante baptizes hundreds of thousands of Indians with his saliva. A Nuño Cabeza de Vaca sets out to find the golden cities of Cíbola and the Fountain of Youth, to be shipwrecked, reduced to starvation, nearly eaten by cannibals, only to return to the fray as soon as he is rescued.

Actors, acts, and motives seem superhuman: their lust for gold and for salvation, their undivided loyalty to a distant monarch, their courage in the face of a thousand obstacles seem to defy simple psychological explanations. They not only made history; they struck poses against the backdrop of history, conscious of their role as makers and shakers of this earth.

But their image of themselves obscures the real greatness of their achievement, for greatness can be measured only on a human scale, not on a divine. Part of their greatness was undoubtedly due to the military tactics employed by a courageous and cunning general. The Spaniards used cavalry to break

through the massed formations of an enemy that had never before encountered horses; they thus avoided hand-to-hand combat in which gunpowder and iron arms would have been of little avail in the face of the wicked Indian swords, beset with obsidian chips. To counteract the Indian firepower of spears and arrows, the Spaniards used the crossbow, the instrument that gained them such a decisive victory in the great battle of Pavia against the remnants of French knighthood. When Spanish cavalry, artillery, and infantry proved impotent against Indian canoes manned by archers in the canals and lagoons surrounding Tenochtitlán, Cortés again carried the battle to the enemy, attacking the embattled capital across the water, from the boards of thirteen ships built on the spot.

None of these military successes would have been possible, however, without the Indian allies Cortés won in Middle America. From the first, he enlisted on his side rulers and peoples who had suffered grievously at the hands of their Mexica enemies. In a decisive way, as Ralph Beals has put it, "the conquest of Tenochtitlán was less a conquest than it was a revolt of dominated peoples." Spanish firepower and cavalry would have been impotent against the Mexica armies without the Tlaxcaltec, Texcocans and others who joined the Spanish cause. They furnished the bulk of the infantry and manned the canoes that covered the advance of the brigantines across the lagoon of Tenochtitlán. They provided, transported, and prepared the food supplies needed to sustain an army in the field. They maintained lines of communication between coast and highland, and they policed occupied and pacified areas. They supplied the raw materials and muscular energy for the construction of the ships that decided the siege of the Mexica capital. Spanish military equipment and tactics carried the day, but Indian assistance determined the outcome of the war.

In an ultimate sense, the time was ripe for a redress in the

balance of power in Middle America. Even Moctezuma, in his abode at Tenochtitlán, must have felt this, for we can read in his hesitations, in his hearkening to omens of doom, evidence of the doubt and uncertainty which was gnawing at the vitals of Mexica domination. The Spaniards provided the indispensable additional energy required to reverse the dominant political trend. Yet they were not mere agents of the indigenous will, mere leaders of an indigenous revolt.

Cortés' genius lay precisely in his ability to play this role, to surround himself with charisma in the eyes of the Indians. Cortés played this role to the hilt, but with calculated duplicity. For the Spaniards had not come to Middle America to restore an indigenous society. They acted from autonomous motives which were not those of their Indian allies. Accepting the command of a people deeply accustomed to obedience through long participation in a hierarchical social order, they began to enact their own purposes, to realize their own ends, which were those of Spanish society and therefore alien and hostile to those of the Indians among whom they had begun to move.

To understand these ends, we must try to understand Spanish society of that time, a task in which we moderns experience a particular difficulty. The reduced and impoverished Spain of today obscures our understanding of the once wealthy and powerful empire upon which the sun never set. All too often, we tend to interpret the past by reconstructing it in the image of the present. Again, too often, we view Spain through the lens of a powerful political mythology, a mythology forged both consciously and unconsciously in Protestant countries to advance the liberating cause of Protestantism and republican institutions against Catholicism and monarchical absolutism.

Let us not forget that the Mediterranean and not the European North is the homeland of capitalism and of the Industrial Revolution. Italy, southern France, Spain, and southern Ger-

many witnessed the rise of the first factories, the first banks, the first great fairs. At the time of the discovery of America, the Iberian Peninsula harbored thriving cities, humming with expanding wealth and trade. The sources of this prosperity were manifold: the sale of wool to England or to Flanders; the sale of iron wares to the Levant; the seizure and sale of slaves from the African coast; the quick raid on a Saracen stronghold or a pirate's lair. These were enterprises which demanded the utmost in individual stamina and personal valor; they were also exceedingly profitable.

There were in reality two Spains, or two tendencies at work in the Iberian Peninsula. The first tendency was aristocratic, oriented toward warfare and the gain of riches by warfare. It was exemplified most clearly by the armies of Castile, composed of a warlike nobility and a warlike peasantry. These armies had been forged in the fight against the Moors, first in raid and counterraid, later in the systematic reconquest of the Moorish southland. The nobility, partly organized into religious orders of monastic warriors, saw in warfare a ready source of ego enhancement and looted wealth. Its traditional economic interest lay in the extension of grazing range for its herds of cattle and sheep, coupled with a flourishing export trade in wool to northern Europe. The peasantry, on the other hand, consisted of soldier-cultivators, recruited into the army by promises and guaranties of freedom from servile encumbrances and charters of local self-rule. These peasants desired land, free land, to divide among their sons. In warfare, both nobility and peasantry gained their divergent ends.

The other Spain, the other Spanish trend, was less involved in warfare; it pointed toward capital accumulation through rising industry and trade in the hands of a town-based bourgeoisie. Such entrepreneurs existed in all Peninsular towns; but only in eastern Spain, centered in Catalonia, had they gained

sufficient power to check the expansionist desires of the aristocratic soldiery. In this part of Spain, a bloody peasant war had smashed the remnants of a feudal system of the classic European kind. Traditional relationships in which a lord exercised economic, judicial, and social control of a group of serfs had given way to new social ties. A free peasantry populated the countryside; a prosperous bourgeoisie, long oriented toward maritime trade, controlled the towns. The country was undergoing incipient industrialization, and the cloth, leather, and iron wares so produced were exchanged in the eastern Mediterranean for the drugs, dyestuffs, and luxury goods of the Orient.

By 1492, these two Spains were headed for collision, a conflict which might well have altered the face of Spain but for the discovery of America. The fall of the last Moorish redoubt put an end to the limitless acquisition of land by conquest and to the easy accumulation of wealth by forceful seizure; 1492 marked the closing of the Spanish frontier. As land became scarce, interests which had run parallel up to that time began to conflict; while the soldier-peasant wanted unencumbered land, the aristocrat wanted open range for sheep and cattle or land for dependent cultivators. With the distribution of the fruits of conquest among the conquerors, moreover, readily available wealth became unavailable. How was new wealth to be produced? To this problem the merchant-entrepreneur of the towns had an answer: capital investment in industry coupled with the reduction of aristocratic power. At this moment, however, the doors to the New World swung wide open to reveal a new frontier: dream cities of gold, endless expanses of land, huge reservoirs of dependent labor. The merchant-entrepreneur receded into obscurity; the knight-adventurer, the visionary of wealth through seizure at sword's point, gained new impetus.

It was this new frontier which settled the fate of Spain. Paradoxically, Spanish industry was to be swamped in a tide of gold from the Indies, which spelled its ultimate ruin; paradoxically, also, the new frontier destroyed the class which might have carried such industrialization to a successful conclusion. For in this New World, all men—peasant, merchant, impoverished noble, noble merchant-prince—could dream of becoming lords of land, Indians, and gold. Men who in Spain might have allied themselves politically and economically with the entrepreneurs and traders of the towns against the aristocrat could in this new venture identify themselves with the ideal of the mounted noble. Men who in Spain might have spurred the growth of the middle classes were here converted into its opponents. The year 1492 might have marked Spain's awakening to a new reality; instead, it marked the coming of a new dream, a new utopia.

Where men of varied pasts and varied interests engage in a common enterprise, belief in a universal utopia renders possible their common action. Utopia asks no questions of reality; it serves to bind men in the service of a dream. Belief in it postpones the day of reckoning on which the spoils will be divided and men will draw their swords to validate their personal utopia against the counterclaims of their comrades-in-arms. Some came to the New World to find gold; others to find order; still others to save souls. Yet in their common dream they asked no questions of one another.

In the course of their common adventure in utopia they also achieved a set of common usages and understandings which made "the culture of the Conquest" different from their ancestral culture and from the culture still to be in the New World. Their purposes had a transcendental simplicity: gold, subjects, souls. This simplicity patterned their behavior and their thought, some of it conscious, self-imposed. The colonist-

to-be in search of his liberty casts off the traditional forms which he has experienced as shackles and encumbrances. The royal official in search of order abhors the tangle of inherited forms of the Old World. The friar leaves behind him a world which is old and corrupt; in utopia he seeks austerity and clarity. The very process of migration produces a simplified stock of cultural forms.

Men drawn from all walks of life, the conquerors were not a complete sample of their ancestral society. They did not bring with them complete knowledge of the gamut of Spanish culture. Some of this age-old heritage they could not reproduce in the New World because they lacked acquaintance with it. Some of it, however, vanished in the crucible of their common experience, in their need to develop a common cultural denominator to facilitate their common task. Spain, but recently unified under one crown, had remained a cultural plural, a mosaic of many parts. Yet the culture of the conquerors was, by contrast, highly homogeneous. This simplification extended to material goods: only one plow, of the many Spanish plows, was transmitted to the New World; only a few techniques of fishing were selected from the plethora of Spanish fishing techniques and transplanted into the new setting. Simplification extended also to symbolic behavior: speech undergoes a leveling, a planing-down of the formalities of Castilian Spanish into a plain and utilitarian idiom. Left behind are the many Spanish folk fiestas in honor of a multitude of beloved local saints; they yield in the New World to the measured and standardized performance of the formal celebrations of way stations in the life of Christ. The culture of the conquest was, as George Foster has pointed out, *sui generis*. In vain one looks in the culture of these men for the rich varied regional heritage of the mother country.

Some of the conquerors wanted gold—gold, the actual tan-

gible substance, not the intangible "promises to pay" of later capitalism. In this they were children of their times, caught in the contradiction between medieval magic and the modern search for profits. All over Europe men longed for gold, encountered gold in dreams, dug for it under trees and in caves, sold their souls to the devil for it, labored over retorts to obtain it from base metals such as iron or lead.

It was a kind of illness, and Cortés stated it that way—half cynically and half realistically—in addressing the first Mexica noble he met: "The Spaniards are troubled with a disease of the heart for which gold is the specific remedy." The illness was greed, but beyond greed the desire for personal liberty, escape of the ego from bondage to other men, "spiritual autarchy," as Eliseo Vivas has said, "which is achieved only when you are able to say to another man, *a mi no me manda nadie* —no one bosses me; I am lord because I have land and gold and Indians, and I need not beg any favors from you or any one else."

Utopia thus bears at the outset the mark of a contradiction between past and future, a contradiction never wholly overcome. The contradiction is most startlingly illuminated when the Spanish entrepreneur is compared with his contemporary English rival. "The Englishmen," says Salvador de Madariaga, "though on the surface more self-seeking, were in depth more socially minded; the Spaniards, though in appearance more statesmanlike and creative, more intent on 'ennobling' cities and setting up kingdoms, were more self-centered. The Englishman, with his dividends, socialized his adventures, gain, booty; the Spaniard, with his hospitals, foundations, cathedrals, colleges and marquisates, raised a monument to his own self. . . ." The rise of puritanism in the Anglo-American world, so brilliantly analyzed by Max Weber and Richard Tawney, destroyed the contradiction between individual goals and cul-

tural means. For in accepting the Protestant ethic of work and capital accumulation as virtue, the entrepreneur made himself an instrument of production, harnessed himself to the process of capital formation. In Anglo-America, the very means thus became the ends; in Ibero-America, means and ends remained at war with one another, contradictory, unresolved.

If some came in search of gold and its promise of personal liberty, others came in search of order. Their deity was the absolute monarch; their religion the new religion of the reason of state. At the end of the fifteenth century the Spanish crown had just emerged victorious in its political battles against its rivals. With the help of the rising middle classes and the peasantry, it had successfully defeated the attempts of the aristocrats who wished to reduce the king once again to the passive position of a mere *primus inter pares*. Yet this political success but threatened to put the king into the hands of the penny-wise merchants who wished to trade support for a veto over his military and bureaucratic expenditures. The long period of the reconquest had also brought with it a spate of *fueros* or local charters which exempted one or the other local or professional body from the application of the general law; many a king had traded local autonomy for support against the Moorish enemy.

In the conquest of the New World, the crown saw its opportunity to escape the limitations of internal Spanish politics. Gold from the Indies would enrich not only the eager adventurer; a fifth of all gold and silver mined in the New World would be the king's, to finance a royal army, navy, and officialdom, to build the bases of absolutist power upon institutions wholly independent of nobility, middle classes, or peasant cultivators.

The New World would not have to grow, piecemeal, in the shadows of ancient complexities: it would be a planned world,

projected into reality by the royal will and its executioners. Thus utopia would become law, and law utopian.

Was it true that many Indians lived in scattered hamlets instead of stationary, circumscribed, concentrated settlements? Then let there be a law to force them to live in nucleated towns, each with its own church, each surrounded by its own fields—within a measured radius of 560 yards from the church steeple—so that they could learn to order their lives to the tolling of church bells and to the commands of royal officers.

Land and people of utopia had both been conquered by the sword; but it would be the dry scratching of the goose-quill pen upon parchment that would turn utopia into reality. Let each Indian keep twelve chickens and six turkeys and sell them for no more than 4 reales per turkey and 1½ reales per chicken; let each Indian working in a textile mill receive a daily ration of eighteen tortillas or fourteen tamales, plus chili, chick-peas, and beans. No problem was too insignificant to demand solution, and all solutions were solutions of law. Utopia was to be born also with this fatal deficiency implicit in the contradiction of law and reality. Reality is too protean to be wholly covered by law; it soon grows through, around, and over law, leaving but a hollow shell of words, a gesture of etiquette to gloss over the gap between wish and existence. The Latin American world still bears this legacy of law as a gesture to initiate action, to create a new order, and—when the energy of the gesture is spent—to use the law as wish, to wipe out a reality grown beyond law and order, beyond utopia.

Utopia contained many houses. If some men longed for gold, to build upon it their untrammeled liberty, and if others sought Indian subjects to rule and exercise in the spirit of the new order, so there were men who came to save souls. Upon the ruins of pagan shrines and idols in a new continent filled with souls hungry for salvation, yet uncorrupted by the age-old

vices of the Old World, they would erect their own utopia: the prelude on earth of the Kingdom of Heaven. To these prophets of salvation, the conquest of the New World was the call to a great spiritual task: the defeat of Satan in his own redoubt, the redemption of souls languishing in his power, the annunciation of the faith in the one true God. The shock troops of this new faith were the friars, members of the monastic orders, strongly influenced by the reformist religious currents of the times. In some countries, such movements were soon to feed the flames of the Protestant revolution. If this did not happen in Spain, it was not because Spain lacked inflammable intellectual tinder. The economic and political development of the country had given strong impetus to men who began to question long-accepted opinions and to explore new interpretations of Catholicism. Most of these questioners were influenced by Erasmus of Rotterdam (1466–1536), whose teaching de-emphasized the importance of formal ritual and stressed the promptings to piety of an "inner" voice, and by the utopian and reformist thought of Thomas More (1478–1535) and Luis Vives (1492–1540).

The reason that this new religious current did not explode into open rebellion against accepted religious forms is to be found in the character of the Spanish state and the circumstances which surrounded it rather than in the intellectual heterodoxy of the movement. The Spanish state had no need to break with the papacy: it dictated ecclesiastical appointments in its own territory; it possessed the right to read and suppress papal bulls before making them public; it controlled the office of the Inquisition; it even sponsored autonomy in doctrinal matters through its support of the belief in the immaculate conception of the Virgin Mary, long before this belief became official church dogma at the Council of Trent (1545–63).

In other European states the hunger for land and capital was

one of the chief underlying motives for religious reformation; after the break with Rome, the estates of the church were divided among the members of the Protestant faction. In Spain, the frontiers had not yet closed.

Under Cardinal Ximénez de Cisneros, the Erasmists received royal approval. The crown saw in their effort to restore the simplicity and austerity of primitive Christianity—in the face of decay and corruption—a spiritual counterpart to its own efforts to centralize Spain and to endow the new empire with a unified sense of mission. Many of the friars who came to the New World had taken part in this religious renewal. The first twelve friars to set foot in New Spain—the so-called Apostolic Twelve—had all worked to spread the gospel of primitive Christendom in southern Spain. Fray Juan de Zumárraga (1461?–1548), the first archbishop of Mexico, was a follower of Erasmus and familiar with the utopian writings of Sir Thomas More. Vasco de Quiroga (1470–1565), the first bishop of Michoacán, actually established a replica of Sir Thomas More's Utopia among the Indian communities of his bishopric.

All these soldiers of the faith favored poverty over wealth, communal property over private property. Carefully they labored to purge Catholicism of the accumulation of ritual, selecting from the profusion of religious ritual only the major ceremonials celebrating the way-stations of Christ's life.

The utopia of gold and liberty crumbled in the tension between exaltation of the self, through valiant deeds, and wealth, the instrument selected for their validation. The utopia of order remained arrested in the legal gesture, attempting to stem the tide of real behavior. The utopia of faith, too, was to founder, hoped-for morality all too often impotent in the face of stubborn secular demand. And yet, conversion proved a success. The romanticists have long delighted in discovering the

idols behind altars, the Gods of the Cave transformed into Christs hanging upon the Cross, the earth goddesses disguised as Catholic Virgins, the braziers burning copal gum on the steps of the churches, and other evidences of pre-Conquest heritage in the religious beliefs and practices of modern Indians.

There is much that is Indian in the Catholicism of Middle America; but more surprising than the numerous survivals of pre-Conquest ideas and rituals is the organizational success of the Catholic utopia in a country of different religions and languages. Wherever you go in Middle America, you encounter the images of the Catholic saints and the churches built by the conquerors. Christ and the Virgin may have been transmuted by the adoration of men who had worshipped the Sun and the Moon and the Earth and the Lords of the Four Directions; but when an Indian speaks of a human being today, he does not say "a man"; he says a "a Christian," a believer.

How is this success to be explained? It is easy to dismember men with cannons; it is more difficult to tame their minds. Certainly military defeat played a part, because it provided a visible demonstration of the impotence and decadence of the Mexica gods. The Children of the Sun had died by the sword as they had lived by the sword. The old gods had failed. When the Spaniards had demanded that the Totonac of Cempoala destroy their idols, the people had recoiled in horror; yet when the conquerors hurled the idols to the ground and broke them to pieces, the idols had remained mute and defenseless. They had not smitten the foreigners; they had failed to show the power that was in them. When the priests released the stones from the Pyramid of Cholula which held back the magic water that was in the mountain so that it would drown the strange men in a flood, the channel remained dry, and their magic deserted them. When the Children of the Sun, the Toltec rulers

of Tenochtitlán, called down the wrath of their terrible idol Hummingbird-on-the-Left upon their enemies, Hummingbird-on-the-Left remained silent. The mutilated idols of their gods now rested on the bottom of the lake from which they had set out to conquer the universe for the sun; and the rubble of their temples served as fill for the new city of Mexico which was to arise upon these ruins. The old gods were dead, and powerless.

Not that these old gods had been so greatly loved. We know —or we can guess—that the will of these gods and the burden of human sacrifice rested heavily upon the land. Worship of warrior gods and human sacrifice were religious activities consonant with the military character of Mexica expansion. Inevitably, however, peace and political consolidation brought to the fore alternative religious explanations of a less militaristic character. Quetzalcoatl, the Shining Serpent, served as a symbolic form through which these new interpretations and longings could find expression. His latter-day attributes as a harbinger of peaceful productivity and human wisdom bear surprising similarity to the ideological dictates of Christianity. Indeed, the Spanish friars came to believe that Quetzalcoatl had been none other than the apostle Thomas, come to the New World to convert the Indians. The longing for peace and for an end to bloodshed provided a fertile soil for the diffusion of the Christian message.

Both religions, moreover, believed in a structured and ordered supernatural world, in which more powerful, unseen, and unfathomable divinities stood above local supernatural mediators of lessor scope and power that were yet more immediately tangible. The Middle American peasant, like his Spanish counterpart, focused his religious interest on these lowlier supernatural helpers. He was more interested in the powers that affected his crops, his children, his family, and the people with whom he was in immediate and personal contact, than in

the ultimate powers and their manifestations, which absorbed the interest of the religious specialist. Among the gods of a multi-headed pantheon, his daily concern was with the gods of the earth, fertility, rain and water, with illness, with the immediate short-range future, with the malevolence of his neighbors. Where the Spanish peasant worshipped wooden saints, the Middle American peasant worshipped clay idols; both had recourse to the magical practices of folk medicine; both had a strong sense of omens; and both believed in the reality of witches who could be ordinary everyday people during the day and malevolent spirits in animal disguise at night.

The priests, the specialists of both religions, on the other hand, were the heirs of rich and complex intellectual traditions, trained in the esoteric interpretation of religious symbols whether these symbols concerned multiple incarnations of Tezcatlipoca or the implications of the Revelation of St. John the Divine. The concern of the priest was not the concern of the peasant, and yet the same religious structure could embrace both. As long as the priests remained in command, as ultimate mediators between gods and men and ultimate interpreters of this relationship, men could adapt the manifold religious patterns to suit their personal and local concerns. What was true of religious concerns also held true of gods. A god could be one or triune, unique or multiple, and interpretation could stress his oneness at one time, his multiplicity at another. The Mexica pantheon had embraced many local gods, and the Mexica priesthood had labored to equate these gods with their own inherited deities or with one another. The Catholic Church had a similar tradition of flexibility. Just as the cloak of the Virgin hid many a local Persephone or Isis along the shores of the European Mediterranean, or as an Odin hanging himself from the tree of life became a Christ, so a Hummingbird-on-the-Left became a Spanish St. James riding down upon

the heathens; a Tlaloc, a Christian Señor de Sacromonte; a God of the Cave, the Lord of Chalma; and Our Lady Spirit, the Virgin of Guadalupe.

The Catholic Church drove out the priests of the old gods and manned the pivotal points of the religious hierarchy with men ordained in its own cult. It destroyed the old idols and put an end to human sacrifices, burned the sacred picture books and relegated to oblivion much of the calendric and divinatory knowledge of its predecessors; but it also offered the common man a way in which he could cast his traditional attachments into new forms. The Catholic Church, like the solar religion of the Mexica rigid at the heights of command but flexible on the level of the peasant household, built a bridge from the old order to the new. As Frank Tannenbaum has said, "It gave the Indian an opportunity . . . to save his faith in his own gods."

This transition from the old to the new was eased also by an astonishing similarity in ritual and symbol between the old and the new religion. A Nahua or an Otomí would hardly know what to make of a Spanish friar who, hampered by the language barrier, pointed first to the sky to indicate heaven and then to earth to indicate hell, as a first lesson in Catholic catechism. But rituals can be observed and learned by imitation. Both religious traditions had a rite of baptism.

In Catholicism, the child was baptized and named, thus including him among the true believers. The Mexica similarly bathed and named the child in a religious rite, and the Maya celebrated with a ceremony the first time the child was carried astride the hip. Both religious traditions had a kind of confession. The Mexica and the inhabitants of the Gulf coast confessed their sexual transgressions to a priest of the earth goddess Filth-Eater; the Zapotec had annual public confessions; and the Maya confessed themselves either to priests or mem-

bers of their families in case of illness. Both religious traditions possessed a ritual of communion. The Catholics drank wine and swallowed a wafer to symbolize their contact with the divine blood and body of Christ; the Mexica consumed images of the gods made of amaranth and liberally anointed with sacrificial blood. Both people used incense in their churches; both fasted and did penance; both went on pilgrimages to holy places; both kept houses of celibate virgins. Both believed in the existence of a supernatural mother; and both believed in virgin birth. Where Catholics held that Mary conceived immaculately through the power of the Holy Spirit, the Mexica believed that their goddess Coatlícue had given birth to Hummingbird-on-the-Left, impregnated by an obsidian knife which fell from the sky. Both people made use of the cross. A white St. Andrew's Cross, representing the four directions of the universe, often graced the hat and shield of the Shining Serpent, and the Maya made frequent use of the symbol of the foliated cross. The Spaniards represented their sacred stories in passion plays; the Middle Americans represented the annual changes of vegetation and activities in their sacrifices.

The Catholic missionaries well recognized the danger which lay in the maintenance of similar outward forms, of ritual upon conversion. Yet they were themselves unable to decide whether these similarities were merely the work of Satan laboring to duplicate in his hellish church the rituals of the church sanctified by God, or whether they might not indeed represent the precipitate of some previous Christian teaching, brought to the New World perhaps by no less a personage than the apostle Thomas. Whatever their doubts, the formal similarities between the two religious traditions permitted an easy transition for the worshipper and gave him continuity precisely in the realm in which continuity was vital: the realm of religious behavior.

Nor did the psychology of Spanish Catholicism differ greatly from the psychology of the Mesoamerican solar cult. The Spanish ideal of the austere knight, defending his honor and the Virgin against Moors or other unbelievers, was not far removed from the Mexica ideal of the jaguar-eagle knight, whose obsidian sword insured victory and sacrificial victims for the hungry deities of war. In both religions cruelty against others in warfare and exalted pride went hand in hand with sacrificial penance—cruelty against the self, performed by a Spanish conqueror in a hairshirt, by a Mexica noble torturing his flesh with the sharp spikes of the century plant.

True to their hierarchical habits, the Spaniards expended their greatest religious effort in converting the nobles, who became their first converts, partly because of the similarity of motivation, partly because of a desire to achieve a secure place in the new Spanish hierarchy through baptism and Christian vows. At Tlaxcala, the first center of the Spanish missionary effort, the local aristocracy strove mightily to reserve for itself a monopoly of all new religious offices, even those of cook, janitor, and gardener in the new monasteries. Their children were the first beneficiaries of Spanish ecclesiastical schooling. They used their power to set the feet of their own tributaries upon the new road to salvation; these tributaries thus came to church, as Fray Mendieta said, "more for the sake of outer appearance, to follow the orders of the *principales* who wanted to deceive them than to find a remedy for their souls." With the nobles firmly dedicated to the worship of the new religion, the commoners could be converted in mass, often with no more than a token understanding of the new divinities they were to worship. Pedro de Gante, exemplary Franciscan and kinsman of Charles V, baptized Indians in Mexico City at a daily rate of 14,000.

To the task of mass conversion, moreover, the church

brought an exemplary table of organization. Like the Middle American religion, it drew a line between religious specialists and lay worshippers. In both traditions, the priests were the final spokesmen of the divine realm, in contact with a world to which ordinary men had no access. In both religions, long training was required to make a man worthy of his special role, and in both religions, fasts, penances, self-torture, and sexual abstinence were required of priests to maintain their spiritual worth in the sight of the divine powers. Throughout the exercise of their spiritual role on earth, dress, residence, speech, and comportment marked them off from ordinary men. Such parallelism again eased the transition from the worship of the old gods to the worship of the new, maintaining as it did the hierarchy of channels through which supernatural commands were passed down to the lay believer.

To be sure, the Catholic Church was organized internally to take maximum advantage of the opportunities so offered. Its division into holy orders and secular clergy made for great flexibility in a situation where an advance guard was needed to establish new beachheads of the faith, while a rear-guard took over and consolidated the gains. The friars were the advance guard; the abiding missionary work of the sixteenth century which laid the basis for all later religious efforts was probably carried out by no more than one thousand individuals. Established in fortified churches within the core areas of the newly won land, they spread out in "missions of penetration" into areas where Spanish political control was often still in doubt, sometimes ahead of Spanish armies, sometimes in their wake.

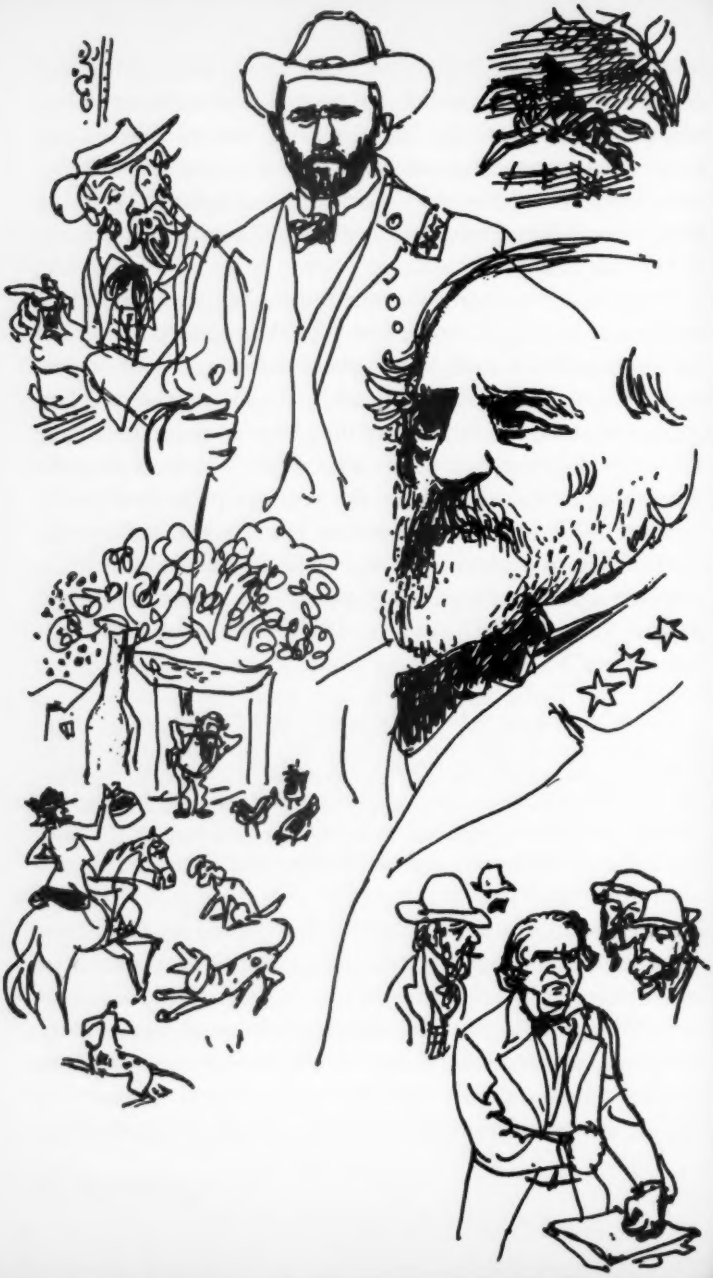
Inevitably there were quarrels and conflicts of jurisdiction as the work progressed, as well as conflicts of temperament. The holy orders recruited men whose personalities differed markedly from those characteristic of the regular clergy. The

friars favored individuals who were more adventurous and utopian in outlook, as well as less amenable to routine and less adapted to the day-to-day life of a going society. The secular clergy showed more conservatism, less of a tendency to sacrifice reality to otherworldly visions and schemes. Thus the larger church benefited by its possession of both kinds of men, both kinds of organization.

The eventual adjustment of the religious dream to mundane reality was less than utopia, and yet it left an impress on the Indian population such as no other religious or political current has done to this day. Ultimately the message of salvation spelled hope for the Indian, not only hope in the transcendental realm of a supernatural life after death but hope on earth, where utopia was yielding to the pressure of all too secular interests. Men would labor to deny him his humanity, to defend his use as a resource, a tool to be used and discarded at will; but against such claims of politicians, lawyers, and theologians, Pope Paul III would in 1537 assert, in his bull "Sublimus Deus":

> The sublime God so loved the human race that He not only created man in such wise that he might participate in the good that other creatures enjoy, but also endowed him with capacity to attain the inaccessible and invisible Supreme Good and behold it face to face[;] . . . all are capable of receiving the doctrines of the faith. . . . We . . . consider . . . that the Indians are truly men. . . .

To the Indian, the rite of baptism thus proved an assertion of his essential humanity, to be a man with human claims upon other men. Of this right no colonist or royal official could rob him. When the Indian re-emerges from beneath the wreckage of utopia, we find that he has rebuilt and cemented his new life with bonds drawn from the new religion, at once his opium, his consolation, and his hope of ultimate justice.



Anatomy of the ANECDOTE

By LOUIS BROWNLOW

A few tales
from a master story-teller's
collection

BY WAY OF INTRODUCTION

YEARS AND YEARS ago I thought it would be a good idea to write a book about the anecdote. I knew what an anecdote was, but I wasn't so sure that other people did anymore, and I felt that the art ought to be memorialized even if it wasn't being perpetuated. I wanted to call my book "The Anatomy of the Anecdote," because I thought that appropriate to a world somewhat more scientific than the one into which I was born. Somehow the book never got written. I didn't take that as proof that it couldn't be done—just that I wasn't the one to do it.

As I advanced in years and fell into my anecdotage, I was persuaded that someone ought at least to write down some examples of what used to be exercised as the art of the anecdote. I haven't found that very easy either. Anecdotes don't

"write down" the way they "tell." They have a natural resistance to being hog-tied to paper and ink. They protest the shackles of the written word; they cry out against the constrictions of punctuation and of spelling which cramp their style, deprive them of freedom of inflection and accent, allow for so little variation in emphasis, leave no room for the meaningful pause or the illustrative change of tempo, and above all do not hesitate for the encouraging little laugh, the "ohs" and "ahs" of recognized reference. Nor can the written or printed word invoke in absentia that bright countenance of the anticipatory listener which is the coin that admits to the feast of Ambrosia and Nectar spread before the lyric Story Teller by Apollo, his god.

The anecdote does demand the classic unity of a beginning, a middle, and an end, but it finds its beginning in the memories and minds of its hearers, devises no plot for its middle and, therefore, needs no dénouement for its end. For its end it needs only the jolt of "finis"—with sometimes a little afterplay for savor. In some ways the anecdote is the last surviving relic of the pre-printing, pre-book era when news and gossip and history were sung to the accompaniment of the lyre. Such was the birth of poetry and the origin of art.

In the heyday of the anecdote everybody knew both the singer and the song. The anecdote was part of a leisurely age when people sat around and had time to talk and inclination to listen, when communities were smaller and more intimately aware of the fancies and foibles which enrich life and give storytelling its flavor.

The anecdote here in the United States went out as the wisecrack came in along with all the marvels of modern mass communication. Amusement spread out across the country and professionalized and unified entertainment in ways which, in the Ozarks where I was born, would have been beyond

imagination. The anecdote faded into the wisecrack, the joke, the material of the comedian. Will Rogers set up the wisecrack on Broadway just as Mark Twain, a generation or two earlier, had set up the anecdote on the lecture platform.

But something was gone. The storyteller regaling his friends with his own amused view of the life they lived in common—this was gone.

The lack of shared knowledge has inhibited not only my putting anecdotes on paper but even my telling of them. Each audience, I find, is a little younger than the last, a little more involved with newer, different—they think—questions of life, and a lot less aware of things which now are history but which, when I first heard about them, were merely current events. I, for example, was born fourteen years after Lee surrendered to Grant at Appomattox, and the Civil War stories my parents told me sound different when I tell them to anyone born fourteen years after the Spanish-American War, or fourteen years after the end of World War I. As a result, each time I tell these stories I have found myself explaining things which were just part of the atmosphere when I was younger but which are now, I suppose, history. In writing them down here I have tried to separate the background from the anecdote itself as much as I could.

The background is history and should be accurate. But accuracy and anecdotery are enemies. It used to be well understood that the two words were actually contradictions in terms. The oil of the anecdote will never amalgamate with the vinegar of accuracy. But commingled, however ephemerally, they will serve to dress a salad or adorn a table. . . . Let any reader endeavor to find accuracy in *my* anecdotes at his peril.

I started out with the full intention of defining an anecdote for you. I was going to be precise the way my academic colleagues are precise with their definitions. I can't do it. I can

borrow the concept ot relativity, however, and recall for you the only "relative" definition of an anecdote I think I ever heard.

There was once a Kentuckian, a soldier, a politician, a statesman, named Joe Blackburn. Joseph Clay Stiles Blackburn was his full name, and he was a great storyteller. He was a man also of wonderful voice. He was a member of the House of Representatives who played a leading role in the dramatic touch-and-go climax of the disputed election of 1876 which put Rutherford B. Hayes in the White House instead of Samuel J. Tilden.

They tell the tale of a picnic, which in Kentucky was usually called a burgoo, as in Virginia it would have been a Brunswick stew. Brunswick stew is made of corn, green corn cut off the cob, squirrel meat, and other ingredients—venison if possible—which are cooked together in a great iron pot over an open fire for a period of at least eight hours. That same concoction with much red pepper added is a burgoo in Kentucky.

Blackburn was invited to a burgoo. Thirty or forty of his old friends were there. He was discovered withdrawing a little from the crowd and weeping. An old friend came up and anxiously asked:

"What's the matter, Joe, why are you crying?"

"It's this crowd," whimpered Joe.

"Now what's the matter with this crowd?"

"This terrible, terrible crowd," Joe moaned, "it's breaking my heart."

"But they're all your old friends and supporters, Joe."

"I know that but this crowd's too damned big for an anecdote, and not near big enough for an oration."

As a definition, I am afraid that will have to do.

A FEW OF MY OWN

I HAD LIVED in Washington as a journalist for more than a decade before I became President of the Board of Commissioners of the District of Columbia and in 1906, with three or four newspapermen, began to gather daily for luncheon in the Grill Room of the Willard Hotel. That group grew and grew, mainly by the addition of other newspapermen and various celebrities. It became known eventually as the Doughnut Cabinet. We had a great many out-of-town visitors of various types. One of them, Louis D. Brandeis, later Chief Justice of the Supreme Court, always ate lunch with us when he came to town. So did Edward A. Filene of Boston and Colonel George B. Harvey of *Harper's Weekly*. Also Norman Hapgood and Mark Sullivan of *Collier's Weekly*, and David Belasco, the great theatrical entrepreneur, and Houdini, the magician.

One of our number who was the managing editor of the then *Washington Times*, Fred Walker, was very adept at bringing in the Lions, as we called the celebrities. One of the great English humorists of the time was in Washington. We didn't really know whether his name was Jérome K. Jérome or Jeróme K. Jeróme, but we did know he was the author of two popular books which all of us had read: *Three Men in a Boat* and *House Boat on the Styx*. We did know he was a great humorist. There was a great flutter in the New York papers over his visit, and the humorous lectures he was giving in New York. We also knew that he was invited to dinner with President Wilson at the White House. Fred Walker secured him for lunch earlier that day. Nearly all of us turned up. We were all eager to see and hear this famous humorist. One of the principal activities of the members of the Doughnut Cabinet was not only eating lunch but telling stories while we were eating lunch. All of us knew as a matter of implicit faith that no

Englishman, not even an English humorist, could appreciate a joke, and here was an unusual Englishman to furnish us basis for our faith. Each of us decided to furbish up his best story to tell him. We told stories. We told excruciatingly funny stories. But Jerome K. Jerome never cracked a smile.

One after another of us going around and around the table told his tale. Everybody but Jerome K. Jerome burst with laughter after every sally.

Not a smile from the Englishman. Bob Woolley, who was an extremely good storyteller, told the tale of a group of Negro actors down in Alabama who had put on a Shakespearean play, *Othello*, and played it in schoolhouses and churches. When the handkerchief scene was reached, Othello said, "Desdemona, whar am dat hankercher?" No satisfactory reply. "Desdemona, I ax you again, whar am dat hankercher?" Again no adequate reply. "Desdemona, fer de third and de last time, I ax you whar am dat hankercher?"

Whereupon a woman in the back of the audience got up, and in a loud voice shouted, "Nigger, blow your nose on your sleeve, and let this here show go on."

No response from the Englishman.

My colleague as District Commissioner, Oliver P. Newman, was one of the greatest raconteurs I have ever known, and always accompanied his storytelling with a little stage business. His business had to do with rolling a cigarette. Newman, as he got nearly to the climax of a tale, always stopped and rolled a cigarette, keeping everybody hanging in suspense on the top shelf for what seemed like hours.

Newman, after everybody else retreated into the silent limbo of utter defeat, came up with the story of a dramatic critic on a Dane County, Wisconsin, county newspaper. The critic wrote: "The D'Oyly Opera Company, last night in the Court House produced a play called *Hamlet* written a long time ago.

For a great many years there had been a dispute about who was the author of this play. Some persons say it was written by Lord Bacon, some say by Lord Oxford, some say it was written by an actor called William Shakespeare. Now all that remains to be done"—Newman rolled a cigarette slowly, slowly, slowly and then went on—"all that now remains to be done to settle this controversy is to open the graves of the three men in question. The one that turned over last night wrote *Hamlet.*"

And Mr. Jerome K. Jerome turned and inquired, "I say, Mr. Newman, how did you say they were to settle the controversy?" We gave up. We were the most dejected and dispirited and defeated group of persons who had ever entertained a humorist at luncheon.

The next morning I had occasion to see President Wilson. I went to the White House, was shown into the President's office, and as I walked in Mr. Wilson burst out laughing. I was a little disturbed and looked to see if there was any disarrangement of my clothes, but he kept on laughing.

"I'm awfully sorry," he said. "I must apologize, but Jerome K. Jerome was here to dinner last night and he told us some of the stories you told him at lunch yesterday. He said the moment he got there he was certain that each of you had furbished up his best story in order to make an English humorist laugh at an American tale, but he was determined to vindicate the honor of the British Empire. He said it was the toughest job he ever had, but he succeeded in smothering his laughs, even his smiles."

One of my heroes of the war who became my personal friend was John Singleton Mosby. Colonel Mosby I knew very well. He had been, of course, the most sought-after Rebel raider. He called himself, and was called by the Confederates

and by General Lee, a partisan ranger. He was called a guerrilla and worse names by Yankees, who threatened to hang him. One story Mosby told us remains a favorite of mine. He got word that the first breech-loading rifles ever made were coming down (a whole shipment of them) to General Pope commanding the Union Forces in Virginia. With these rifles the Union Army would undoubtedly defeat Lee and walk into Richmond. So it was believed. The rifles were carried in a great train to Alexandria, loaded onto wagons, some fifty or sixty of which were being escorted by the Thirteenth Pennsylvania Cavalry. The munitions wagon train was to park right in the heart of General Pope's army. Getting this information, Mosby decided to do something about it. It was a very, very wet, rainy, cold spring night. He waited and the escort came along. Mosby, debouching from a road at the left, rode up with the Colonel boot-to-boot. The Colonel saluted. "Colonel Graham," said Mosby, "the orders have been changed; your men are tired and have been thirteen hours on the march. My orders are to take over and escort the wagon train to another parking place." The Colonel gave over, and Mosby took over, and parked the munitions train in the heart of General Lee's army. Thus it was that the Confederates had breech-loading rifles and ammunition before the Union troops had them.

Mosby told us that story one morning, and that afternoon I stopped in the Cairo Hotel before dinner and went in to the bar to get a cocktail. I knew the bartender, Dave Pike, very well. There was nobody in the bar but an old gentleman with a white mustache and a white mane of hair. He was enjoying a highball. I walked up to the bar, and the friendly bartender said, "Mr. Brownlow, I would like to introduce you to General Montrose Graham." I, unthinkingly, said, "Are you the General Montrose Graham who commanded the Thirteenth Pennsylvania Cavalry in the Civil War?" He looked at me

with astonishment. After a long pause he said, "I am, but how does a young fellow like you know that?"

"Well, now," I said. (I saw then that I had been very gauche, and I didn't know what to say.)

He then said: "I lost that regiment under very peculiar circumstances; but I was later given another command and I made my way up; I retired as a major general, and from the day I lost that regiment I have never met anybody that knew I had any connection with the Thirteenth Pennsylvania Volunteer Cavalry. I *demand* you tell me how you knew it."

"General Graham," I had to say, "I never heard of you until this morning when I heard of you from Colonel John S. Mosby."

He exploded. "That raider, that guerrilla, is he still alive? He ought to have been hanged. Why didn't they hang him?"

And then he calmed down, and I said, "Well, would you like to see him again?"

"No!—Yes, I would."

I said, "Well, you come down to my office just a little before ten o'clock tomorrow morning," and I told him where the office was.

General Graham came. At ten promptly, as he was always prompt, Colonel Mosby opened the door and walked in, this awful scowl upon his face—this terrific countenance, this hawk's-bill nose, this one glaring eye, evidently outraged that anybody else should be in the office, which he had begun to consider as his own. General Graham rose and I said, "Colonel Mosby, I would like to reintroduce you to Colonel Montrose Graham of the Thirteenth Pennsylvania Cavalry."

Mosby's evil faced gleamed like that of a seraph, the most delightful smile you have ever seen spread over his countenance. They shook hands; they sat down. Graham said, "You were in a blue coat."

"I was not in a blue coat," retorted Mosby. "It was a gray coat, but it was so wet you thought it was blue." Then they patted each other on the knee. The time came for Harris and me to go to the Capitol. We left them still fighting the war all over again.

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